STIC Search Report

EIC 1700

Scientific & Technical Information Center
USPTO

STIC Database Tracking Number: 178838

TO: Ardith Hertzog
Location: REM 9A20
Art Unit : 1754
February 8, 2006
10/786,671
Case Serial Number: ~~PCT/US/05645~~

From: Kathleen Fuller
Location: EIC 1700
REMSEN 4B28
Phone: 571/272-2505
Kathleen.Fuller@uspto.gov

Search Notes

Claim 14 limited by date (through 2004) and references already printed for claims12-13 were also removed, leaving 29 references.

Access DB# 178833

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: ARDITH E. HERTZOG Examiner # : 71465 Date: 2.7.06
Art Unit: 1754 Phone Number 30 2-1247 Serial Number: PCT-US04-05645
Mail Box and Bldg/Room Location: Rem 9A20 (Office) Results Format Preferred (circle) PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need. (doesn't matter

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Per attached BIB DATA SHEET =>

Inventors (please provide full names): "

Earliest Priority Filing Date: "

****For Sequence Searches Only** Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

~~[illegible]~~

Please search for 186B polyoxometalates of the attached cl. 14 —

SCIENTIFIC REFERENCE BR
Sci & Tech Inf · Cnt
FEB [illegible]
Pat. & T.M Office

Thank you,
Ardith

STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher: K. Fuller	NA Sequence (#)	STN ✓
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#) 2	Questel/Orbit
Date Searcher Picked Up:	Bibliographic	Dr.Link
Date Completed: 2/8/06	Litigation	Lexis/Nexis
Searcher Prep & Review Time: 35	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time: 35	Other	Other (specify)

PTO-1590 (8-01)

```
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TSCA INFORMATION NOW CURRENT THROUGH JULY 14, 2005

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*******************************************************************
*                                                                 *
* The CA roles and document type information have been removed from *
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* available and contains the CA role and document type information. *
*                                                                 *
*******************************************************************

Structure search iteration limits have been increased.  See HELP SLIMITS
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FILE COVERS 1907 - 8 Feb 2006  VOL 144 ISS 7
FILE LAST UPDATED: 7 Feb 2006  (20060207/ED)

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This file contains CAS Registry Numbers for easy and accurate substance identification.

Claim 14

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=> d que
L2           41 SEA FILE=REGISTRY ABB=ON  (100-42-5/BI OR 10108-73-3/BI OR
                10141-05-6/BI OR 10421-48-4/BI OR 107-92-6/BI OR 109-52-4/BI
                OR 110-81-6/BI OR 110-86-1/BI OR 13093-17-9/BI OR 13138-45-9/BI
                 OR 134360-58-0/BI OR 13770-18-8/BI OR 3251-23-8/BI OR
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                OR 7440-45-1/BI OR 75-07-0/BI OR 75-18-3/BI OR 75-44-5/BI OR
                75-50-3/BI OR 7664-41-7/BI OR 7704-34-9/BI OR 7727-37-9/BI OR
                7783-06-4/BI OR 79-09-4/BI OR 795308-36-0/BI OR 796042-78-9/BI)

L4      1314652 SEA FILE=REGISTRY ABB=ON  ((P OR S OR SI OR AL OR B OR ZN OR
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L5       444419 SEA FILE=REGISTRY ABB=ON  L4 AND 2/NC      claims 11 - 13
L6        10926 SEA FILE=REGISTRY ABB=ON  L5 AND 25-80/O
L7         9409 SEA FILE=REGISTRY ABB=ON  L6 NOT X/ELS
L9          429 SEA FILE=REGISTRY ABB=ON  L7 AND (P OR SI OR AL)/ELS AND (W OR
                MO)/ELS AND V/ELS
L10         413 SEA FILE=REGISTRY ABB=ON  L9 AND 1-6/V          Claim 14
L11           6 SEA FILE=REGISTRY ABB=ON  L2 AND NITRATE
L12         916 SEA FILE=HCAPLUS ABB=ON  L10
L13         484 SEA FILE=HCAPLUS ABB=ON  L12(L)CAT/RL
L14          72 SEA FILE=HCAPLUS ABB=ON  L13 AND ?OXOMETAL?
L15         399 SEA FILE=HCAPLUS ABB=ON  L13 AND HETEROPOLY?
L16           4 SEA FILE=HCAPLUS ABB=ON  L14 AND COMPOSITION?
L17          26 SEA FILE=HCAPLUS ABB=ON  L15 AND COMPOSITION?
L18       16041 SEA FILE=HCAPLUS ABB=ON  L11
L19          25 SEA FILE=HCAPLUS ABB=ON  L13 AND (L18 OR NITRATE#)
L20          48 SEA FILE=HCAPLUS ABB=ON  L16 OR L17 OR L19     48 CA references
L21       17241 SEA FILE=HCAPLUS ABB=ON  L7
L22        3514 SEA FILE=HCAPLUS ABB=ON  L21(L)CAT/RL
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L25          13 SEA FILE=HCAPLUS ABB=ON  L23 AND (L18 OR NITRATE?)
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L28          19 SEA FILE=HCAPLUS ABB=ON  L26 AND (L18 OR NITRATE?)
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                TOXIC?)/SC,SX
L30          77 SEA FILE=HCAPLUS ABB=ON  L24 OR L25 OR (L27 OR L28 OR L29)
L32          70 SEA FILE=HCAPLUS ABB=ON  L30 AND (1840-2004)/PY,AY,PRY
L34          35 SEA FILE=HCAPLUS ABB=ON  (L20 OR L32) NOT L32 - removed claim 11-13
L35          29 SEA FILE=HCAPLUS ABB=ON  L34 AND 1840-2004/PRN,AP,PY   references
                                          limited by date          already printed

=> d l35 bib abs hitind hitstr 1-29
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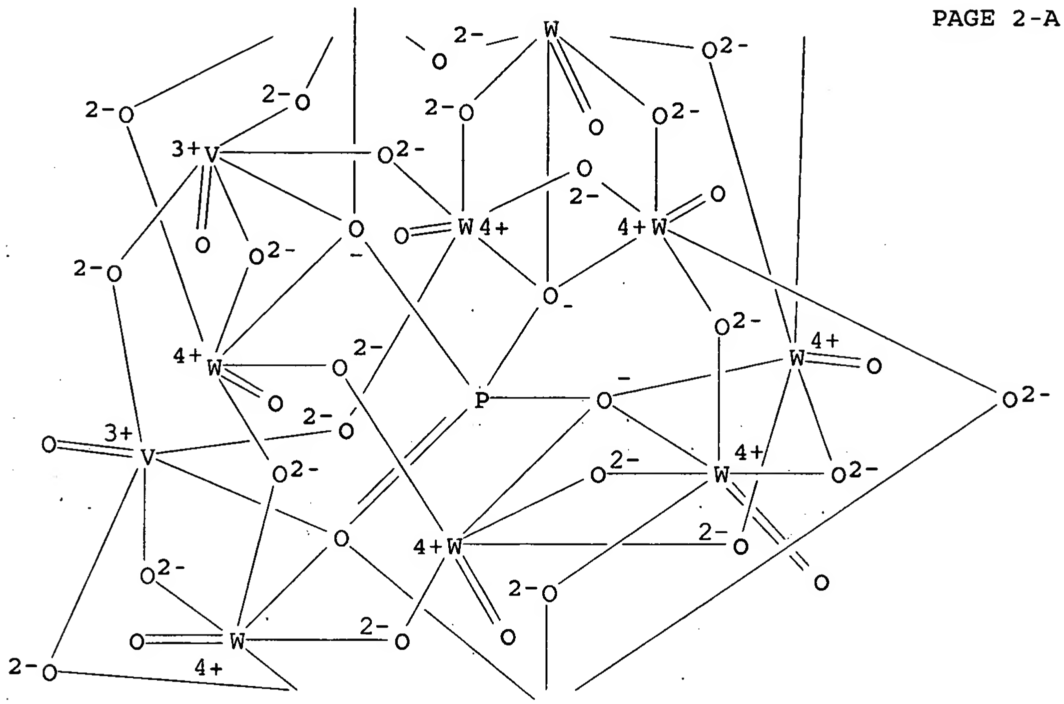
L35 ANSWER 1 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:1120385 HCAPLUS
DN 142:197629
TI Nitration of alkanes with nitric acid by vanadium-substituted polyoxometalates
AU Shinachi, Satoshi; Yahiro, Hidenori; Yamaguchi, Kazuya; Mizuno, Noritaka
CS Department of Applied Chemistry, School of Engineering, The University of Tokyo, Tokyo, 113-8656, Japan

SO Chemistry--A European Journal (**2004**), 10(24), 6489-6496
CODEN: CEUJED; ISSN: 0947-6539
PB Wiley-VCH Verlag GmbH & Co. KGaA
DT Journal
LA English
AB The nitration of alkanes by using nitric acid as a nitrating agent in acetic acid was efficiently promoted by vanadium-substituted Keggin-type phosphomolybdates such as [H4PVMo11O40], [H5PV2Mo10O40], and [H6PV3Mo9O40] as catalyst precursors. A variety of alkanes including alkylbenzenes were **nitrated** to the corresponding nitroalkanes as major products in moderate yields with formation of oxygenated products under mild reaction conditions. The carbon-carbon bond cleavage reactions hardly proceeded. ESR, NMR, and IR spectroscopic data show that the vanadium-substituted polyoxometalate, for example, [H4PVMo11O40], decomps. to form free vanadium species and [PMo12O40]3- Keggin anion. The reaction mechanism involving a radical chain path is proposed. The polyoxometalates initially abstract the hydrogen of the alkane to form the alkyl radical and the reduced polyoxometalates. The reduced polyoxometalates subsequently react with nitric acid to produce the oxidized form and nitrogen dioxide. This step would be promoted mainly by the phosphomolybdates, [PMo12O40]n-, and the vanadium cations efficiently enhance the activity. The nitrogen dioxide promotes the further formation of nitrogen dioxide and an alkyl radical. The alkyl radical is trapped by nitrogen dioxide to form the corresponding nitroalkane.
CC 25-6 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 22, 24
IT **12398-74-2**, Tungstovanadophosphoric acid (H5PV2W10O40)
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using 10-tungsto-2-vanadophosphoric acid as catalyst)
IT **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using hydrogen molybdophosphovanadate (H4Mo11PVO40) as catalyst)
IT **12293-21-9**, Decamolybdodivanadophosphoric acid (H5Mo10V2PO40)
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using molybdovanadophosphoric acid (H5Mo10V2PO40) as catalyst)
IT **12293-24-2**, Phosphovanadomolybdic acid (H6PV3Mo9O40)
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using molybdovanadophosphoric acid (H6Mo9PV3O40) as catalyst)
IT **12398-73-1**, Tungsten vanadium hydroxide oxide phosphate (W11V(OH)4O32(PO4))
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using tungstovanadophosphoric acid (H4PW11VO40) as catalyst)
IT **12398-74-2**, Tungstovanadophosphoric acid (H5PV2W10O40)
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using 10-tungsto-2-vanadophosphoric acid as catalyst)
RN 12398-74-2 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecatungstate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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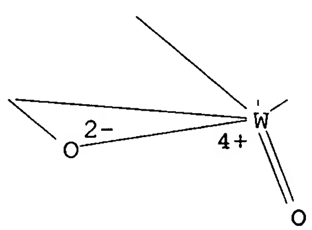
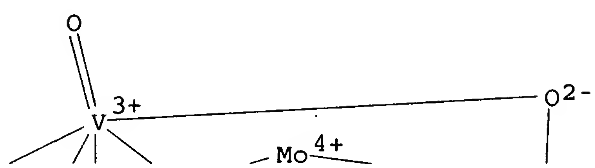


● 5 H^+

IT 12293-15-1
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using hydrogen molybdophosphovanadate (H4Mo11PVO40) as catalyst)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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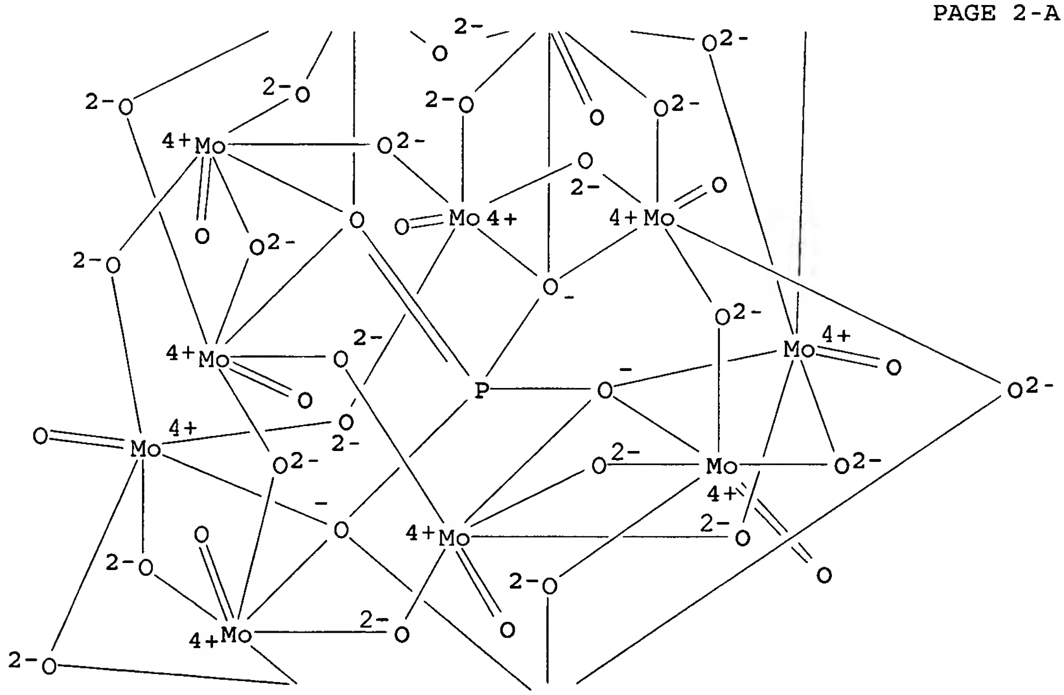
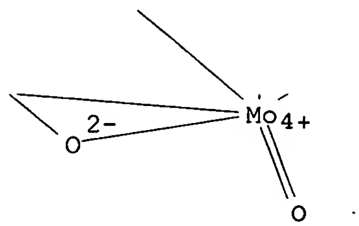
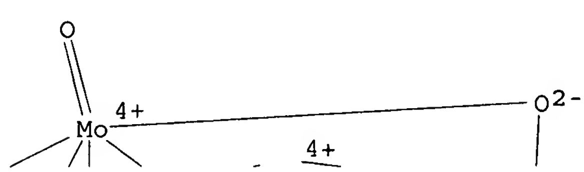




PAGE 3-A

IT 12293-21-9, Decamolybdodivanadophosphoric acid (H5Mo10V2PO40)
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using molybdovanadophosphoric acid (H5Mo10V2PO40) as catalyst)
RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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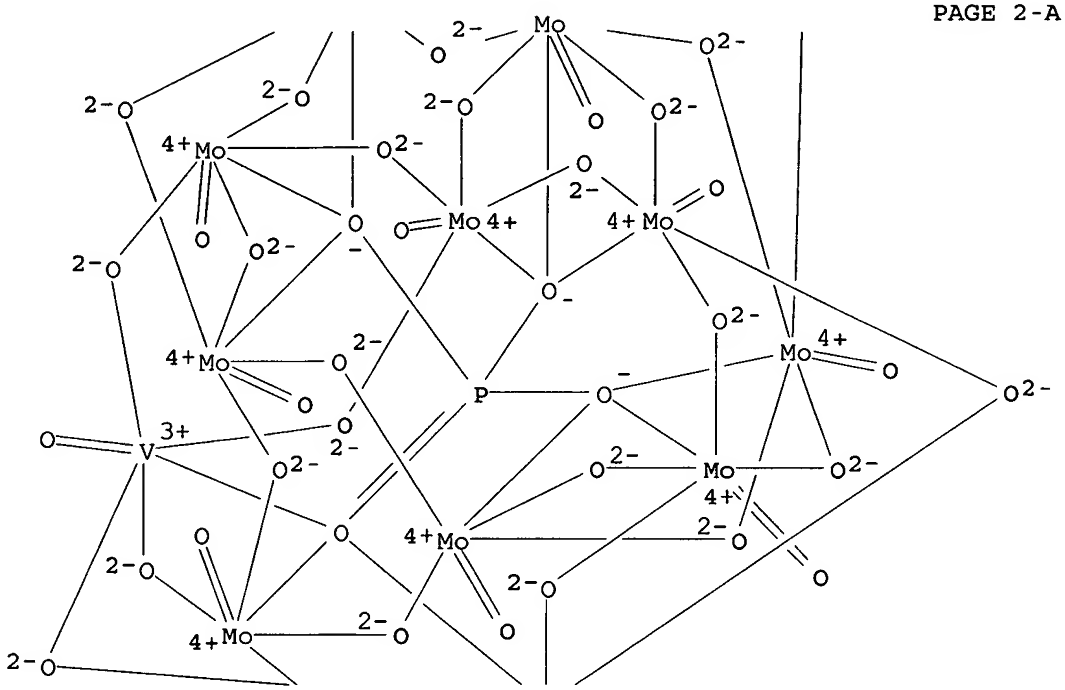

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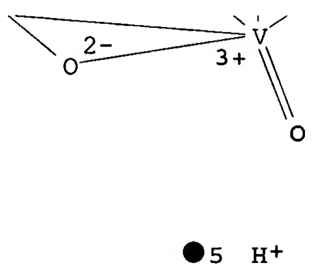
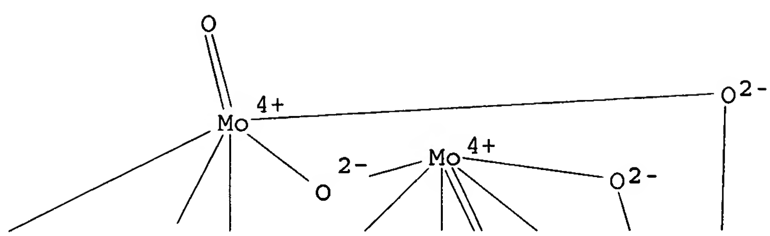


IT 12293-24-2, Phosphovanadomolybdic acid (H6PV3Mo9O40)
RL: CAT (Catalyst use); USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using molybdovanadophosphoric acid (H6Mo9PV3O40) as catalyst)

RN 12293-24-2 HCAPLUS

CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa .O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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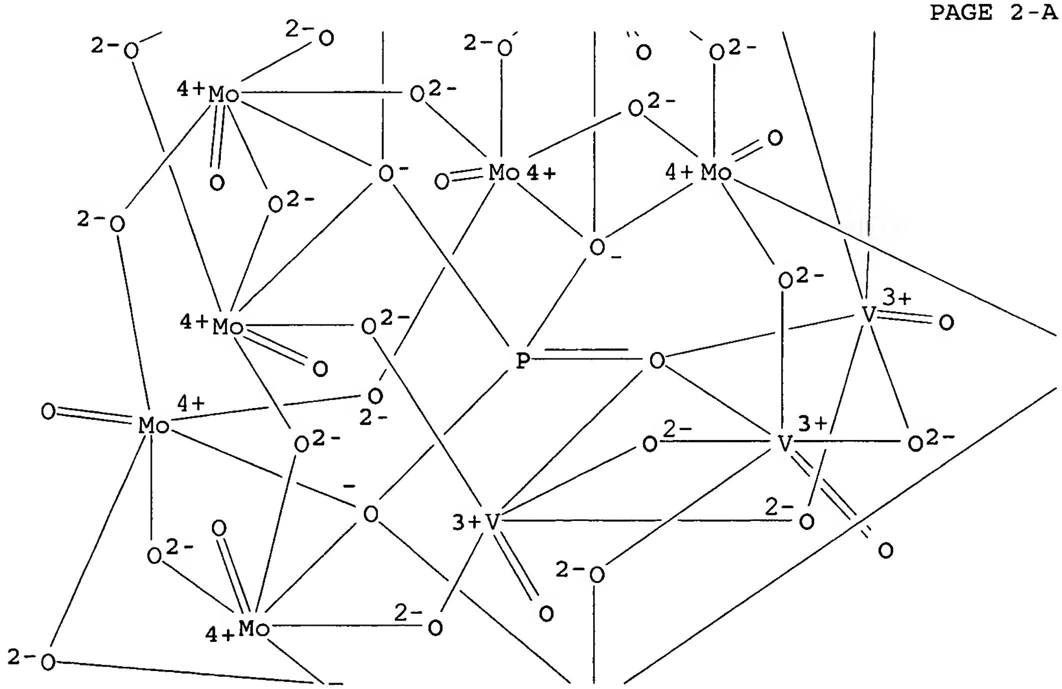

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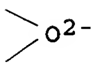

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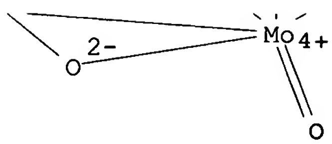
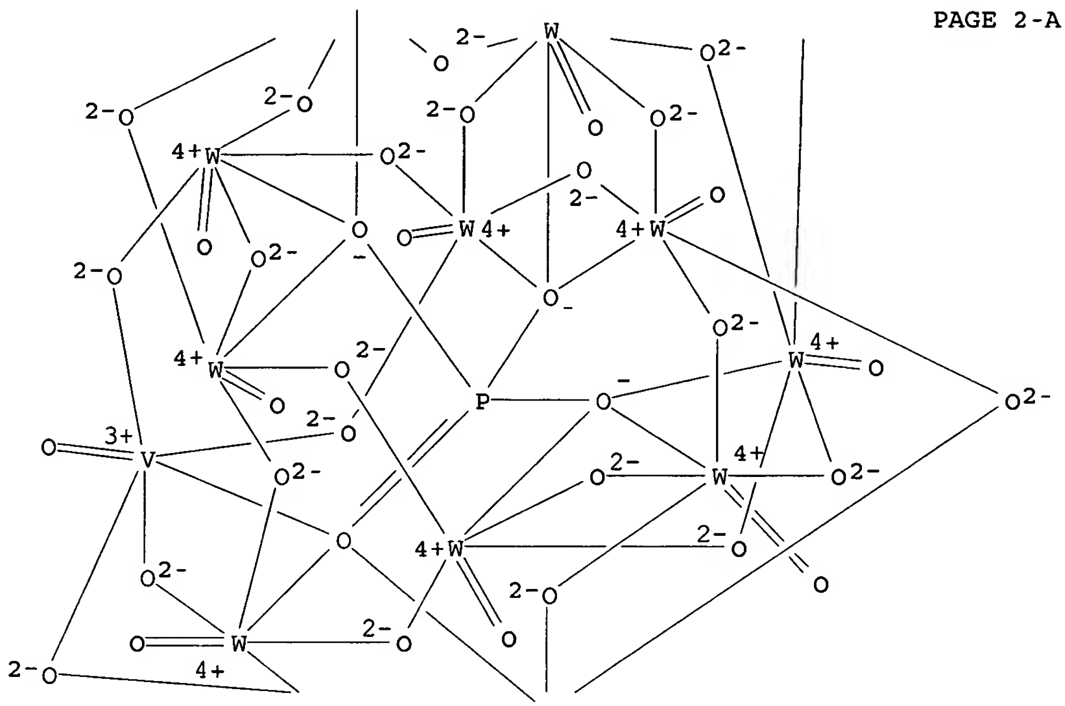


●6 H^+

IT 12398-73-1, Tungsten vanadium hydroxide oxide phosphate (W11V(OH)4O32(PO4))
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of (nitro)alkanes by nitration of alkanes with nitric acid using tungstovanadophosphoric acid (H4PW11VO40) as catalyst)
RN 12398-73-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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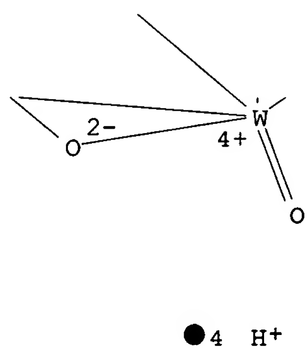


RE.CNT 68 THERE ARE 68 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 2 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:355340 HCAPLUS
DN 141:38270
TI Oxidation of Alkylarenes by **Nitrate** Catalyzed by Polyoxophosphomolybdates: Synthetic Applications and Mechanistic Insights
AU Khenkin, Alexander M.; Neumann, Ronny
CS Department of Organic Chemistry, Weizmann Institute of Science, Rehovot, 76100, Israel
SO Journal of the American Chemical Society (**2004**), 126(20), 6356-6362
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society

DT Journal
LA English
OS CASREACT 141:38270
AB Alkylarenes were catalytically and selectively oxidized to the corresponding benzylic acetates and carbonyl products by **nitrate** salts in acetic acid in the presence of Keggin type molybdenum-based heteropolyacids, H3+xPVxMo12-xO40 (x = 0-2). H5PV2Mo10O40 was especially effective. For methylarenes there was no over-oxidation to the carboxylic acid contrary to what was observed for nitric acid as oxidant. The conversion to the aldehyde/ketone could be increased by the addition of water to the reaction mixture As evidenced by IR and 15N NMR spectroscopy, initially the **nitrate** salt reacted with H5PV2Mo10O40 to yield a NVO2+[H4PV2Mo10O40] intermediate. In an electron-transfer reaction, the proposed NVO2+[H4PV2Mo10O40] complex reacts with the alkylarene substrate to yield a radical-cation-based donor-acceptor intermediate, NIVO2[H4PV2Mo10O40]-ArCH2R+•. Concurrent proton transfer yields an alkylarene radical, ArCHR•, and NO2. Alternatively, it is possible that the NVO2+[H4PV2Mo10O40] complex abstrs. a hydrogen atom from alkylarene substrate to directly yield ArCHR• and NO2. The electron transfer-proton transfer and hydrogen abstraction scenarios are supported by the correlation of the reaction rate with the ionization potential and the bond dissociation energy at the benzylic positions of the alkylarene, resp., the high kinetic isotope effect determined for substrates deuterated at the benzylic position, and the reaction order in the catalyst. Product selectivity in the oxidation of phenylcyclopropane tends to support the electron transfer-proton transfer pathway. The ArCHR• and NO2 radical species undergo heterocoupling to yield a benzylic nitrite, which undergoes hydrolysis or acetolysis and subsequent reactions to yield benzylic acetates and corresponding aldehydes or ketones as final products.
CC 22-7 (Physical Organic Chemistry)
Section cross-reference(s): 67
ST alkylarene selective oxidn **nitrate** polyoxophosphomolybdate catalyst synthetic application mechanism
IT Aromatic hydrocarbons, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(alkyl; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)
IT Isotope effect
(deuterium; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)
IT Heteropoly acids
RL: CAT (Catalyst use); USES (Uses)
(molybdophosphates; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)
IT Oxidation
Oxidation catalysts
(selective; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)
IT Oxidation kinetics
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)
IT Linear free energy relationship
(using ionization potential and C-H BDE as parameters; synthetic

applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 91-20-3P, Naphthalene, preparation 120-12-7P, Anthracene, preparation
RL: BYP (Byproduct); PREP (Preparation)
(aromatization byproduct; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 10102-43-9, Nitric oxide, reactions
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); RGT (Reagent); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)
(control reaction as oxidizing agent; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 14635-75-7, Nitrosonium tetrafluoroborate
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)
(control reaction as oxidizing agent; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 18779-88-9, 1,2-Bis(2,4,5-trimethylphenyl)ethane
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(homo-radical coupling product formed using NO or NO+; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 7782-39-0, Deuterium, properties
RL: PRP (Properties)
(isotope effect; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 15917-77-8, Nitric-15N oxide
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(major product from **nitrate** salt; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 7631-99-4, Sodium **nitrate**, reactions 7790-69-4, Lithium **nitrate**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)
(oxidation agent; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 64-19-7, Acetic acid, reactions
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(solvent, esterification agent, and secondary oxygen exchange reaction with **nitrate**; synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 84-65-1P, Anthraquinone 98-86-2P, Acetophenone, preparation 100-52-7P, Benzaldehyde, preparation 104-87-0P, p-Methylbenzaldehyde 119-61-9P, Benzophenone, preparation 134-81-6P, Benzil 486-25-9P, Fluorenone 529-20-4P, o-Methylbenzaldehyde 529-34-0P, α-Tetralone 5779-72-6P, 2,4,5-Trimethylbenzaldehyde 5779-93-1P, 2,3-Dimethylbenzaldehyde 62346-87-6P, 2,6-Dimethylbenzyl acetate
RL: BYP (Byproduct); PREP (Preparation)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 123-11-5P, p-Methoxybenzaldehyde, preparation
RL: BYP (Byproduct); SPN (Synthetic preparation); PREP (Preparation)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 12026-57-2, Molybdophosphoric acid (H3PMo12O40) **12293-15-1** **12293-21-9**
RL: **CAT (Catalyst use)**; USES (Uses)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 702638-07-1 702638-08-2
RL: CAT (Catalyst use); CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process); USES (Uses)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 86-73-7, Fluorene 92-83-1, Xanthene 95-47-6, o-Xylene, reactions 95-63-6, 1,2,4-Trimethylbenzene 95-93-2, Durene 100-41-4, Ethylbenzene, reactions 101-81-5, Diphenylmethane 103-29-7, 1,2-Diphenylethane 104-93-8, 4-Methylanisole 106-42-3, p-Xylene, reactions 108-88-3, Toluene, reactions 119-64-2, Tetralin 519-73-3, Triphenylmethane 526-73-8, 1,2,3-Trimethylbenzene 527-53-7, 1,2,3,5-Tetramethylbenzene 613-31-0, 9,10-Dihydroanthracene 873-49-4, Phenylcyclopropane 3947-98-6 24624-32-6, Xanthene-9,9-d2 25837-05-2, Ethylbenzene-d10
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 1006-66-2P
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); PROC (Process); RACT (Reactant or reagent)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 31432-45-8 702638-09-3
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RGT (Reagent); PROC (Process); RACT (Reactant or reagent)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 60321-43-9, Acetic-18O acid 702638-10-6 702638-12-8
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

IT 93-92-5P, α-Methylbenzyl acetate 104-21-2P, p-Methoxybenzyl acetate 140-11-4P, Benzyl acetate 954-67-6P, Diphenylmethyl acetate 1006-67-3P, 5-Phenylisoxazole 2216-45-7P, p-Methylbenzyl acetate 13651-57-5P, 2,3-Dimethylbenzyl acetate 17373-93-2P, o-Methylbenzyl acetate 18370-16-6P, 9,10-Dihydroanthracen-9-yl acetate 18543-92-5P, 2,4,5-Trimethylbenzyl acetate 21503-12-8P, α-Tetralyl acetate 24295-35-0P, 1,2-Diphenylethyl acetate 25017-68-9P, 9-Fluorenyl acetate
RL: SPN (Synthetic preparation); PREP (Preparation)
(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by

polyoxophosphomolybdates)

IT **12293-15-1 12293-21-9**

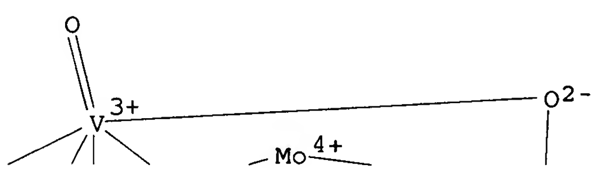
RL: **CAT (Catalyst use)**; USES (Uses)

(synthetic applications and mechanistic insights into the selective oxidation of alkylarenes by **nitrate** catalyzed by polyoxophosphomolybdates)

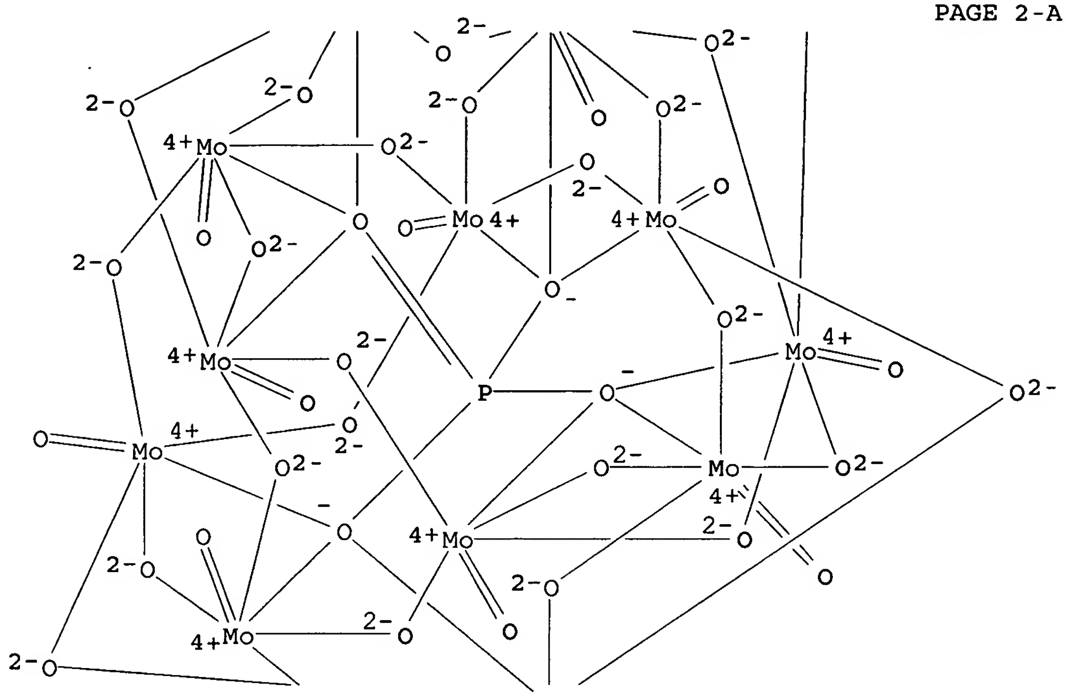
RN 12293-15-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

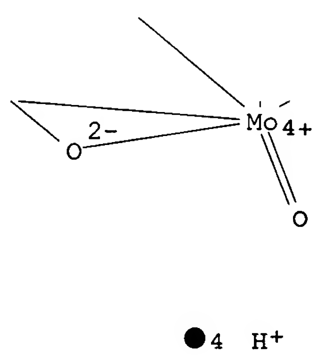
PAGE 1-A



PAGE 2-A

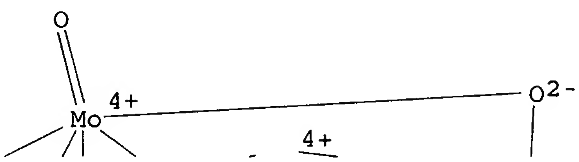


PAGE 3-A



RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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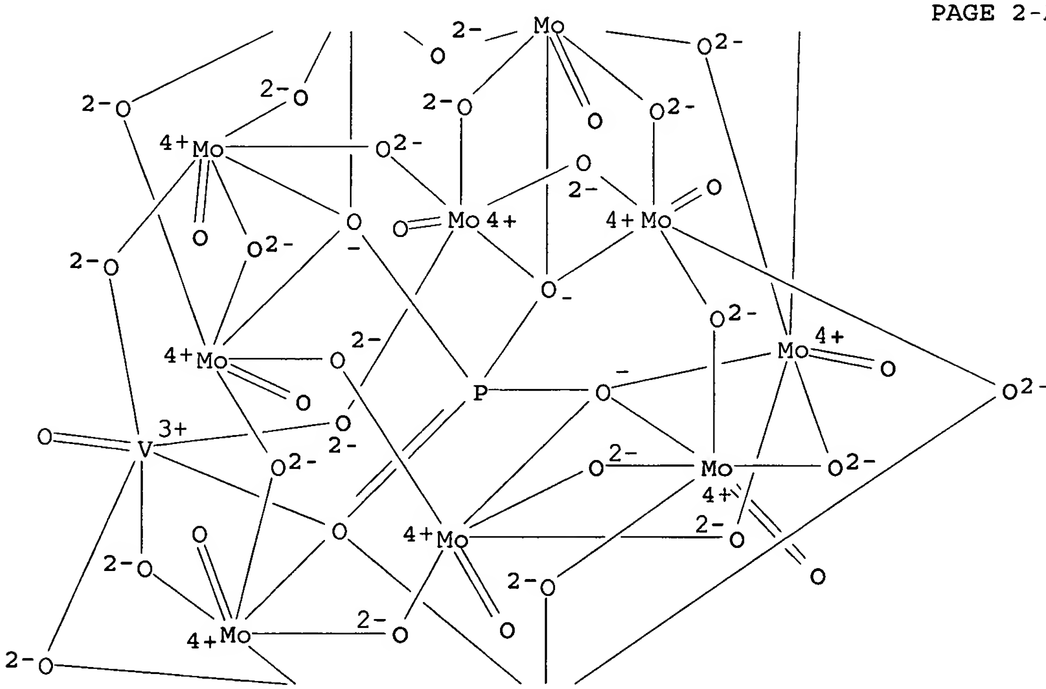

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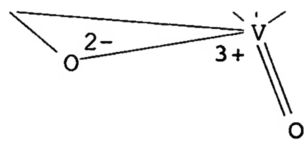
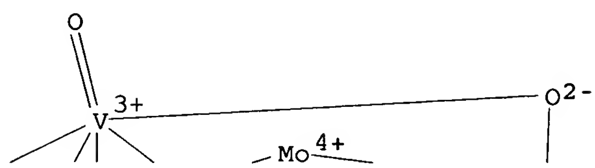


●5 H+

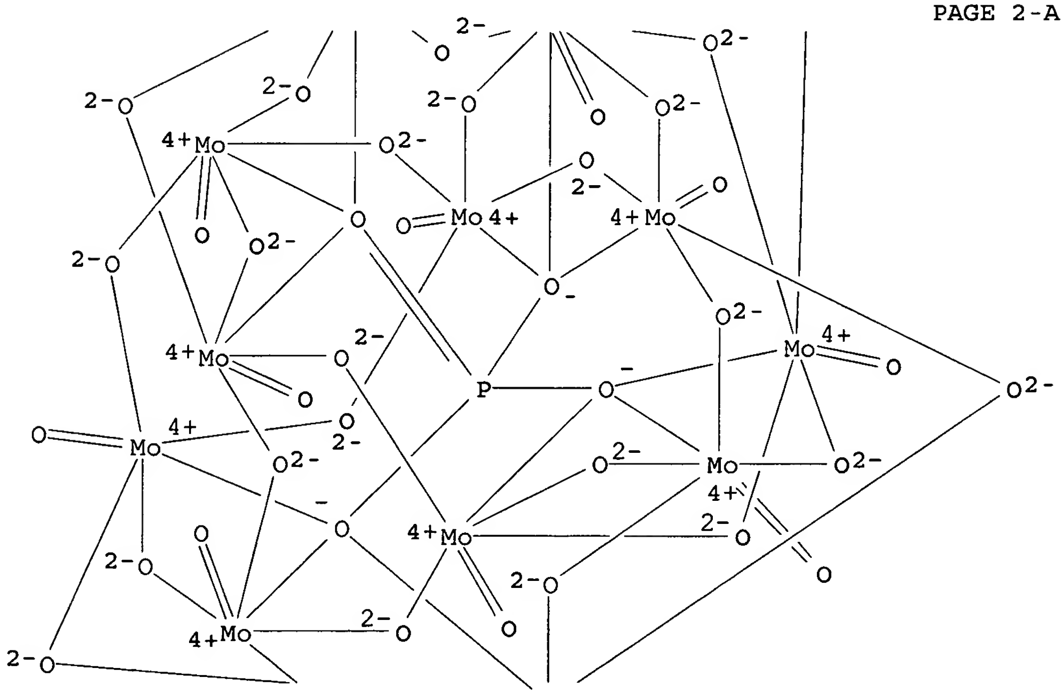
RE.CNT 81 THERE ARE 81 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

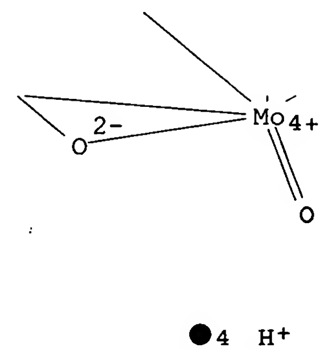
L35 ANSWER 3 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:882816 HCAPLUS
DN 141:90812
TI Conversion of isopropanol to diisopropyl ether on 1-vanado-11-molybdophosphoric and 12-molybdophosphoric acids and on their cesium salt. Effect of SiO2 support
AU Sadou, M.; Rabia, C.
CS Institut de Chimie, USTHB, Laboratoire de Chimie du Gaz Naturel, Algiers, 16111, Algeria
SO Journal de la Societe Algerienne de Chimie (**2003**), 13(1), 39-47
CODEN: JSACEX; ISSN: 1111-4797
PB Societe Algerienne de Chimie
DT Journal
LA French
AB A potential route that received attention is the substitution of Me tert-Bu ether (MTBE) by diisopropyl ether (DIPE) that is a candidate high-octane-number gasoline additive. The 2-propanol conversion to DIPE was studied over bulk and supported **heteropolyacids** H3PMo12O40 (PMo), H4PMo11VO40 (PMoV) and their cesium salt at 100°C. These studies have shown that alc. reactivity depends on the pretreatment temperature (130-400°C) and the **composition** of polyanion. For the whole solids and at all pretreatment temperature, the dehydration of 2-propanol produced DIPE and propene. Weak activity of dehydrogenation (<4%) is observed Selectivity to DIPE, which was observed by using cesium salt and PMo supported on silica of PMo, is higher when the activity is low. These results suggest that there are two types of acidic sites, those which favor the formation of DIPE and those which favor the formation of propene.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 51
IT 12026-57-2 12026-64-1 **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(effect of silica support on conversion of isopropanol to diisopropyl ether on molybdenum and vanadium catalysts)
IT **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(effect of silica support on conversion of isopropanol to diisopropyl ether on molybdenum and vanadium catalysts)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





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RE.CNT 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 4 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:827150 HCAPLUS
DN 140:77439
TI Solid-state chemistry of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate: application to oxidation catalysis
AU Laronze, N.; Marchal-Roch, C.; Guillou, N.; Liu, F. X.; Herve, G.
CS Institut de Reactivite, Electrochimie et Microporosites, Universite de Versailles, UMR 8637, Versailles, 78035, Fr.
SO Journal of Catalysis (**2003**), 220(1), 172-181
CODEN: JCTLA5; ISSN: 0021-9517
PB Elsevier Science
DT Journal
LA English
AB The solid-state behavior of (NH4)4[PMo11VVO40], crystallized from a water/dioxane solution, has been studied. Decomposition of one of the four ammonium cations occurs easily and a thermal treatment in air at 220 °C leads to (NH4)3H[PMo11VO40]. Further ammonium decomposition was observed between 220 and 300 °C up to (NH4)0.8H3.2[PMo11VO40]. Only one cubic phase was evident and the lattice parameter increases as ammonia is eliminated. Rietveld refinement of X-ray patterns of all samples is better with an occupancy of 34 for anionic sites, as previously proposed for Cs4[PMo11VO40]. Solid-state substitution of cesium for ammonium cations has been performed by thermal treatments at 300 °C of the ammonium salt impregnated by cesium **nitrate.** Only three ammonium cations can be substituted. The catalytic behavior of these salts for the oxidative dehydrogenation of isobutyric acid reveals high catalytic activity and selectivity to methacrylic acid for all the samples up to three cesium cations but fall down hereafter.
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67, 78
IT 1066-33-7, Ammonium hydrogen carbonate 7789-18-6, Cesium **nitrate**
RL: RCT (Reactant); RACT (Reactant or reagent)
(in catalyst preparation; solid-state chemical of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate and their performance as catalysts for isobutyric acid oxidation to methacrylic acid)
IT **237393-88-3P**
RL: **CAT (Catalyst use)**; RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(solid-state chemical of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate and their performance as catalysts for isobutyric acid oxidation to methacrylic acid)

IT **68335-84-2P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(solid-state chemical of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate and their performance as catalysts for isobutyric acid oxidation to methacrylic acid)

IT **237393-88-3P**
RL: **CAT (Catalyst use)**; RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(solid-state chemical of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate and their performance as catalysts for isobutyric acid oxidation to methacrylic acid)

RN 237393-88-3 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetraammonium (9CI) (CA INDEX NAME)

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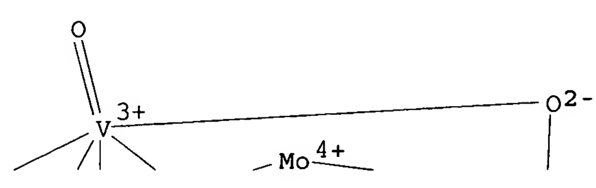

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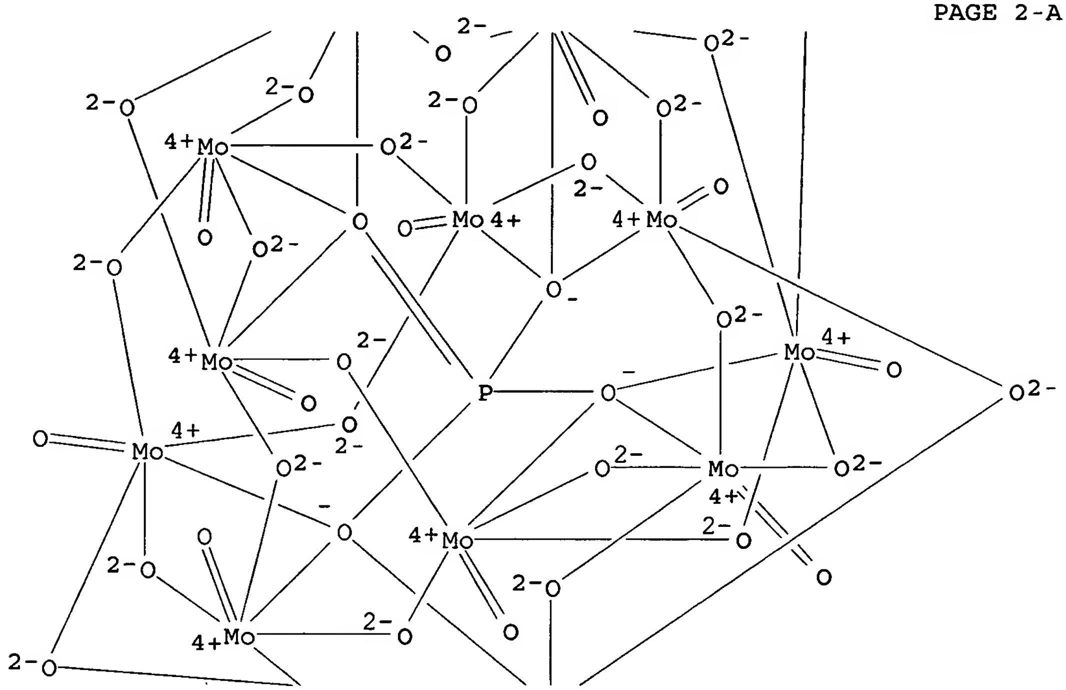

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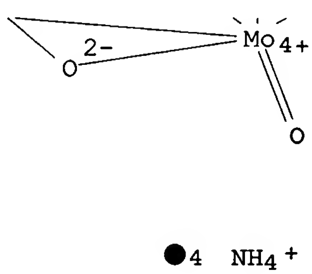

IT **68335-84-2P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(solid-state chemical of ammonium and cesium 1-vanado-11-molybdophosphate and ammonium 12-molybdosilicate and their performance as catalysts for isobutyric acid oxidation to methacrylic acid)
RN 68335-84-2 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetracesium (9CI) (CA INDEX NAME)

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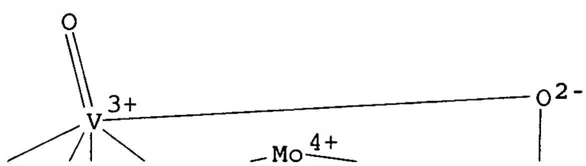

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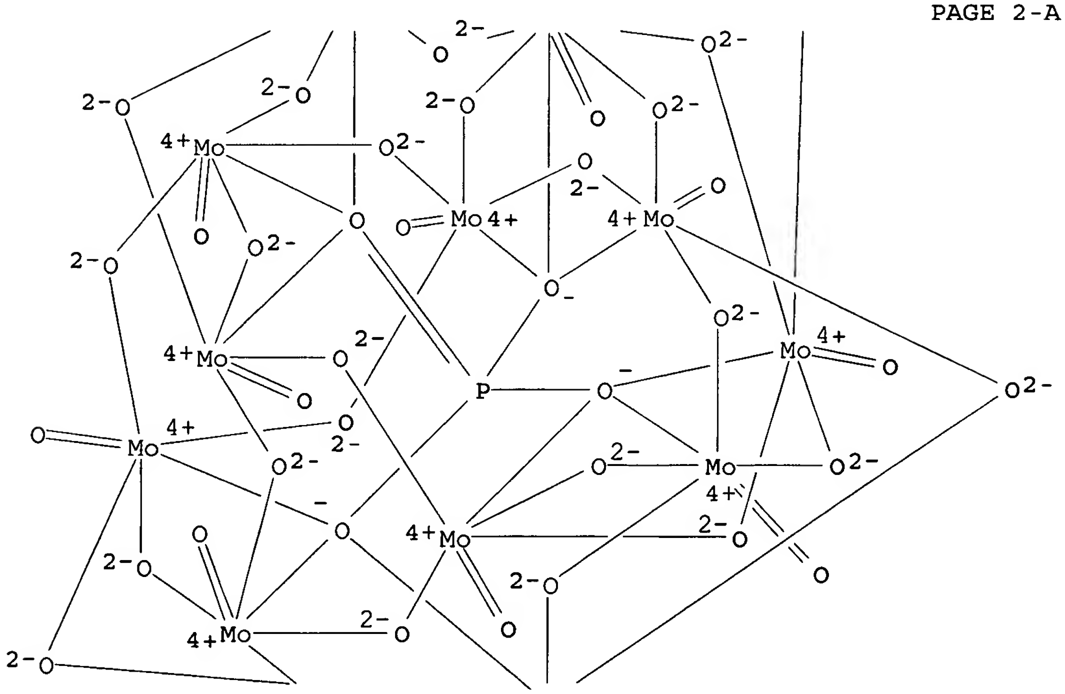
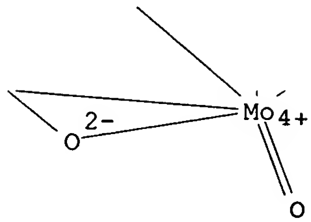
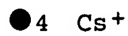




PAGE 3-A



RE.CNT 30 THERE ARE 30 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 5 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:715242 HCAPLUS
DN 140:183533
TI Oxidation of cyclohexene and α-pinene with O2-H2 mixture in the presence of supported platinum or palladium catalysts
AU Kuznetsova, N. I.; Kuznetsova, L. I.; Kirillova, N. V.; Pokrovskii, L. M.; Detusheva, L. G.; Ancel, J.-E.; Likholobov, V. A.
CS G. K. Boreskov Institute of Catalysis, Siberian Branch of the Russian Academy of Sciences, Novosibirsk, 630090, Russia
SO Russian Chemical Bulletin (Translation of Izvestiya Akademii Nauk, Seriya Khimicheskaya) (**2003**), 52(7), 1544-1551
CODEN: RCBUEY; ISSN: 1066-5285
PB Kluwer Academic/Consultants Bureau
DT Journal
LA English
OS CASREACT 140:183533
AB Oxidation of cyclohexene and α-pinene with an O2-H2 mixture in the catalytic systems containing Pt or Pd and **heteropoly** compds. (HPC) was studied. The main oxidation products are epoxides, allyl alcs., and ketones. The highest yield of the oxidation products was obtained in the presence of the platinum catalyst in combination with HPC PW11 or PW11Fe. The reaction mechanism was proposed. A relationship between the HPC **composition** and the nature of intermediates involved in oxidation was examined
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
IT 1112-67-0, Tetrabutylammonium chloride 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 12026-57-2, H3PMo12O40 **12293-15-1** **12293-21-9** **12293-24-2** 53749-36-3 53749-37-4 104484-97-1 **134360-58-0** 135480-92-1 144740-01-2 144740-04-5 144839-08-7 145238-80-8 146066-47-9 **200558-44-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation of cyclohexene and pinene with O2-H2 mixture in the presence of supported platinum or palladium catalysts)
IT **12293-15-1** **12293-21-9** **12293-24-2** **134360-58-0** **200558-44-7**
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation of cyclohexene and pinene with O2-H2 mixture in the presence of supported platinum or palladium catalysts)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kapp

a.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

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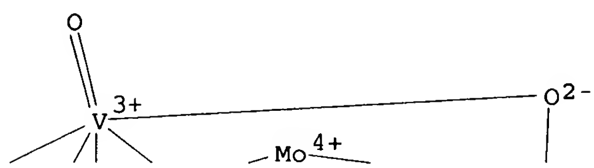

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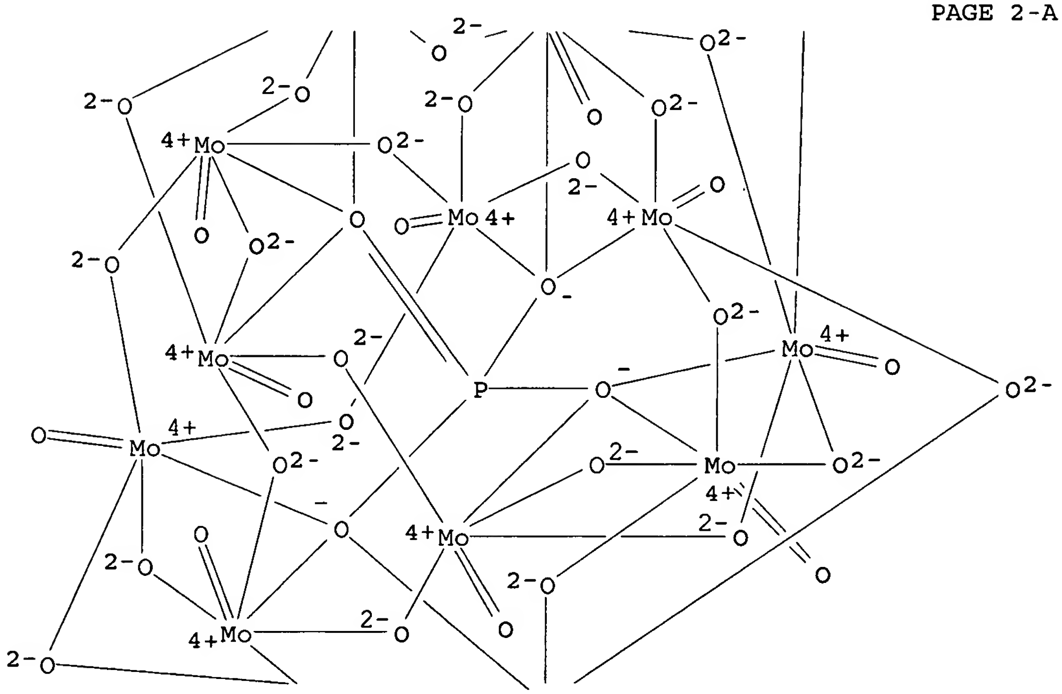

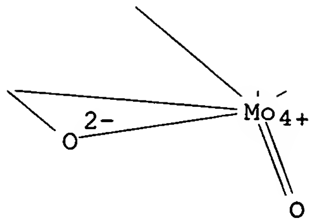

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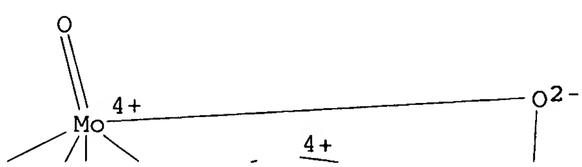
● 4 H^+

RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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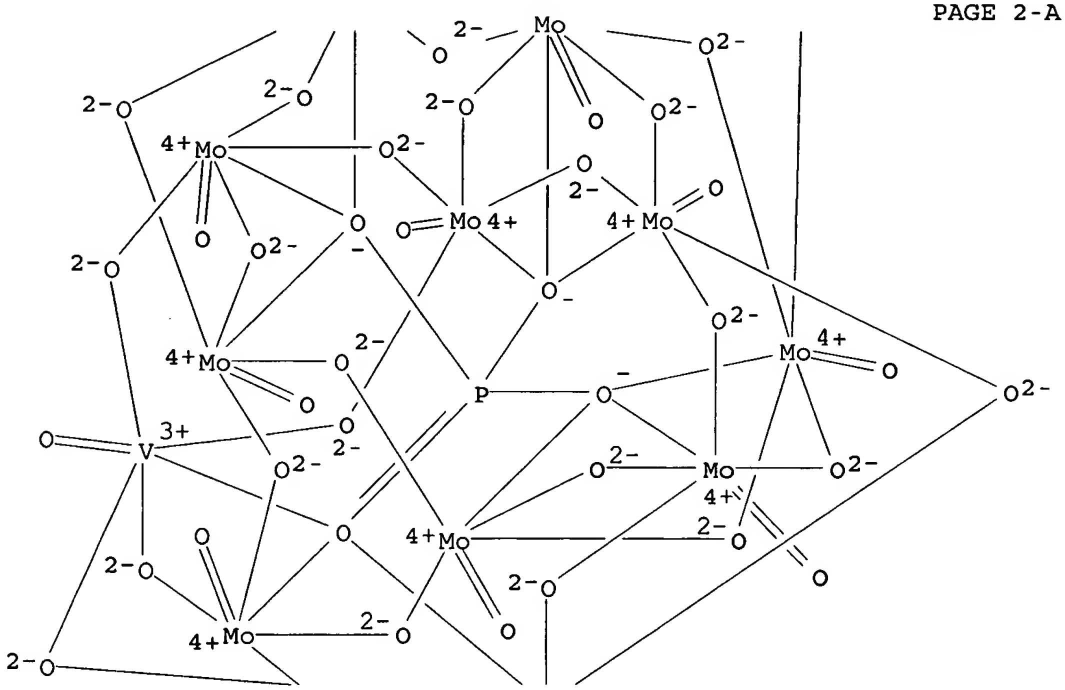

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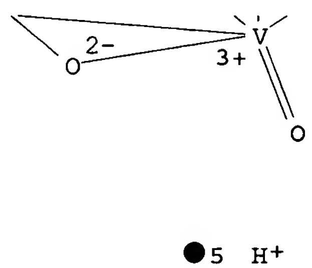
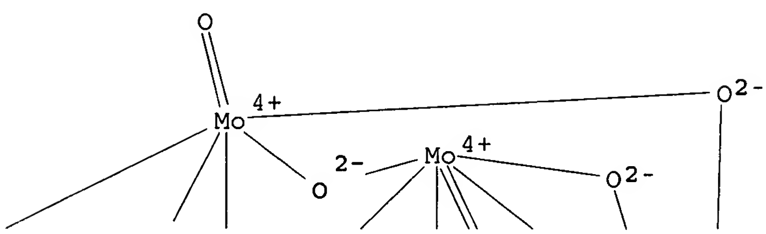


RN 12293-24-2 HCAPLUS

CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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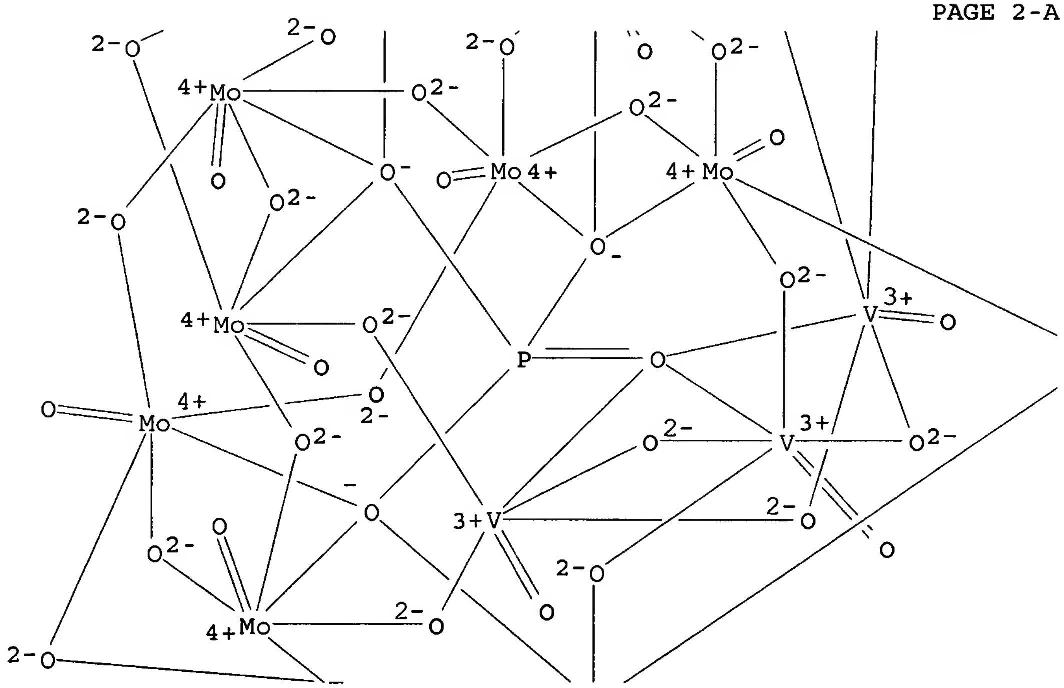

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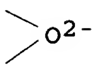

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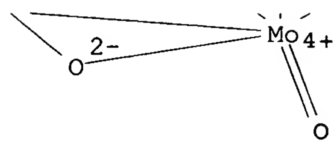


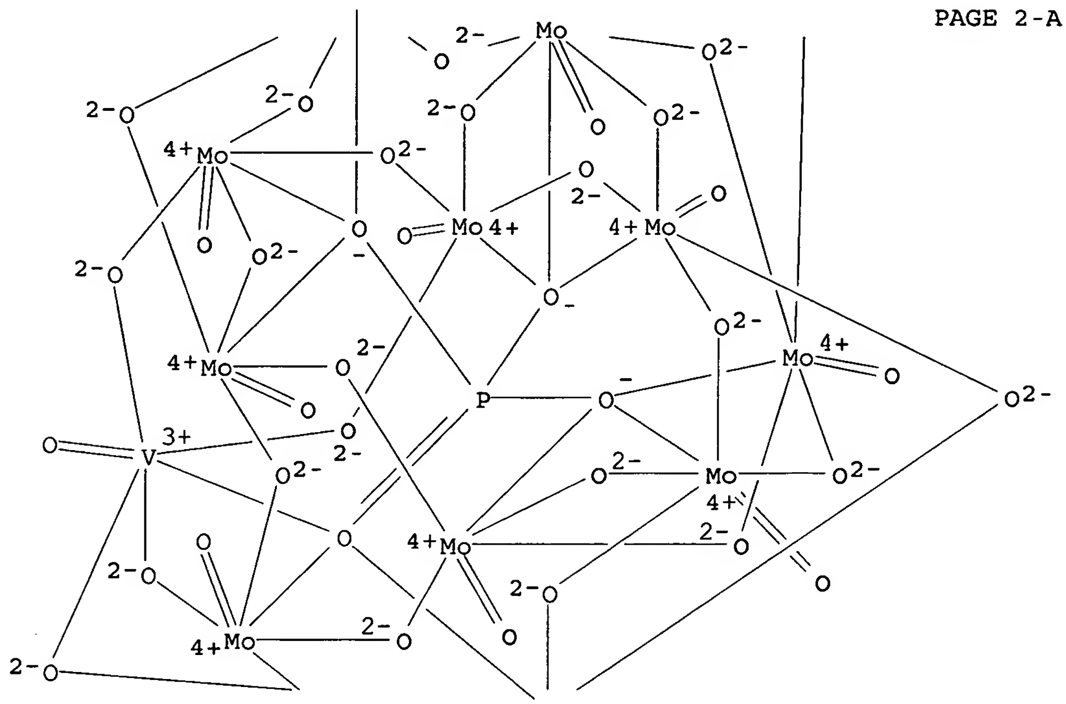
RN 134360-58-0 HCAPLUS
CN 1-Butanaminium, N,N,N-tributyl-, (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]divanadate(5-) (5:1) (9CI) (CA INDEX NAME)

CM 1

CRN 58071-93-5
CMF Mo10 O40 P V2
CCI CCS

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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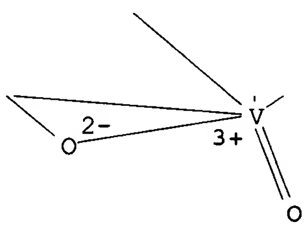
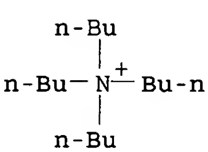


CM 2

CRN 10549-76-5
CMF C16 H36 N



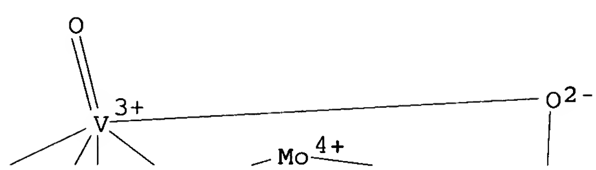
RN 200558-44-7 HCAPLUS
CN 1-Butanaminium, N,N,N-tributyl-, (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]vanadate(4-) (4:1)

(9CI) (CA INDEX NAME)

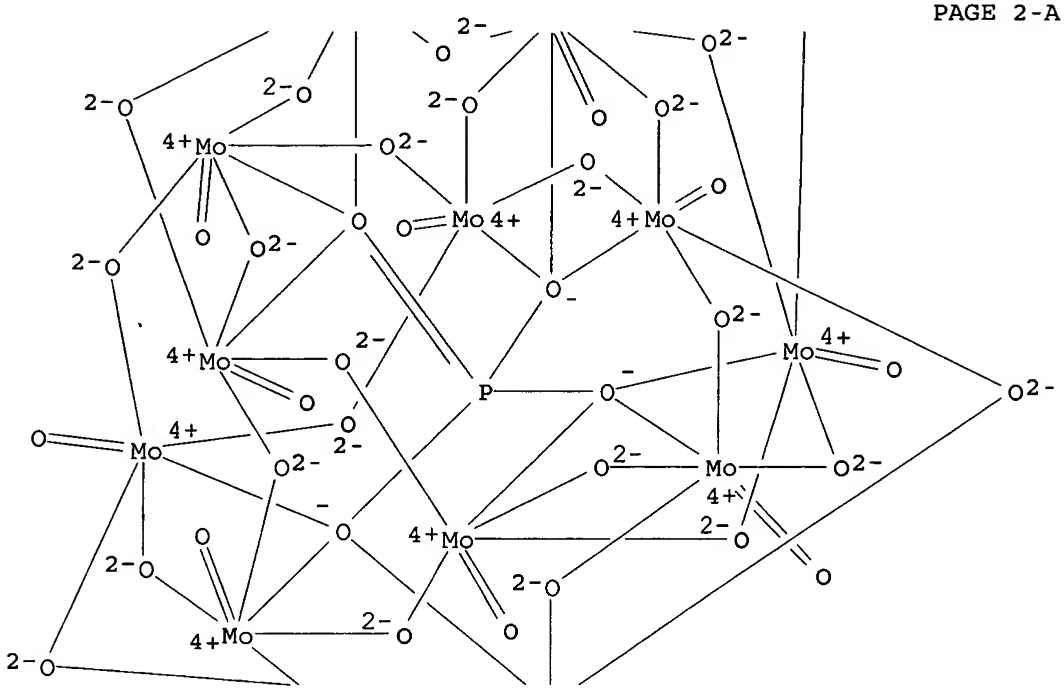
CM 1

CRN 54578-48-2
CMF Mo11 O40 P V
CCI CCS

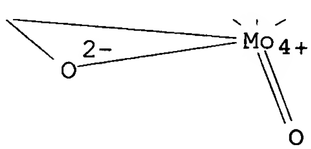
PAGE 1-A



PAGE 2-A

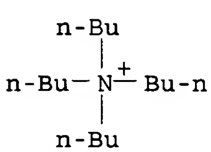


PAGE 3-A



CM 2

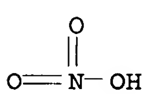
CRN 10549-76-5
CMF C16 H36 N



RE.CNT 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 6 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:562377 HCAPLUS
DN 139:278228
TI Copper- and vanadium-catalyzed methane oxidation into oxygenates with

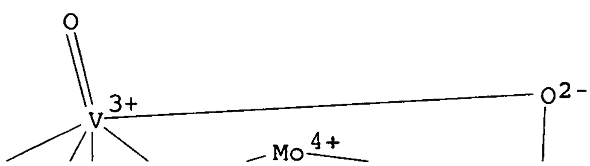
in-situ generated H_2O_2 over Pd/C
AU Park, Eun Duck; Hwang, Yoo-Shik; Lee, Chul Woo; Lee, Jae Sung
CS Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, 790-784, S. Korea
SO Applied Catalysis, A: General **(2003)**, 247(2), 269-281
CODEN: ACAGE4; ISSN: 0926-860X
PB Elsevier Science B.V.
DT Journal
LA English
OS CASREACT 139:278228
AB Copper- and vanadium-catalyzed oxidation of methane into Me trifluoroacetate and formic acid with in-situ generated H_2O_2 from H_2 and O_2 over Pd/C was investigated in trifluoroacetic acid (TFA) and/or trifluoroacetic anhydride (TFAA) as a solvent. Metallic palladium was responsible for the in-situ generation of hydrogen peroxide from dihydrogen and dioxygen. Divalent copper hydroperoxide and monoperoxomonovanadate, $VO(O_2)^+$, seemed to be related to C-H bond activation. The radical chain reaction did not occur in either copper- or vanadium-catalyzed methane oxidation However, Me radical appeared to be produced in vanadium system but not in copper system.
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67
IT 142-71-2, Copper acetate 1314-62-1, Vanadium oxide (V_2O_5), uses 1317-38-0, Copper oxide, uses 1317-39-1, Cuprous oxide, uses **3251-23-8**, Copper dinitrate 7440-44-0, Carbon, uses 7440-50-8, Copper, uses 7447-39-4, Copper dichloride, uses 7758-98-7, Copper sulfate, uses 7803-55-6, Ammonium vanadate (NH_4VO_3) 10102-05-3, Palladium **nitrate 12293-15-1 12293-21-9 12293-24-2** 13718-26-8, Sodium vanadate ($NaVO_3$) 20427-59-2, Copper hydroxide
RL: **CAT (Catalyst use)**; USES (Uses)
(copper- and vanadium-catalyzed methane oxidation into Me trifluoroacetate and formic acid with in-situ generated H_2O_2 over Pd/C)
IT **3251-23-8**, Copper dinitrate **12293-15-1**
12293-21-9 12293-24-2
RL: **CAT (Catalyst use)**; USES (Uses)
(copper- and vanadium-catalyzed methane oxidation into Me trifluoroacetate and formic acid with in-situ generated H_2O_2 over Pd/C)
RN 3251-23-8 HCAPLUS
CN Nitric acid, copper(2+) salt (8CI, 9CI) (CA INDEX NAME)



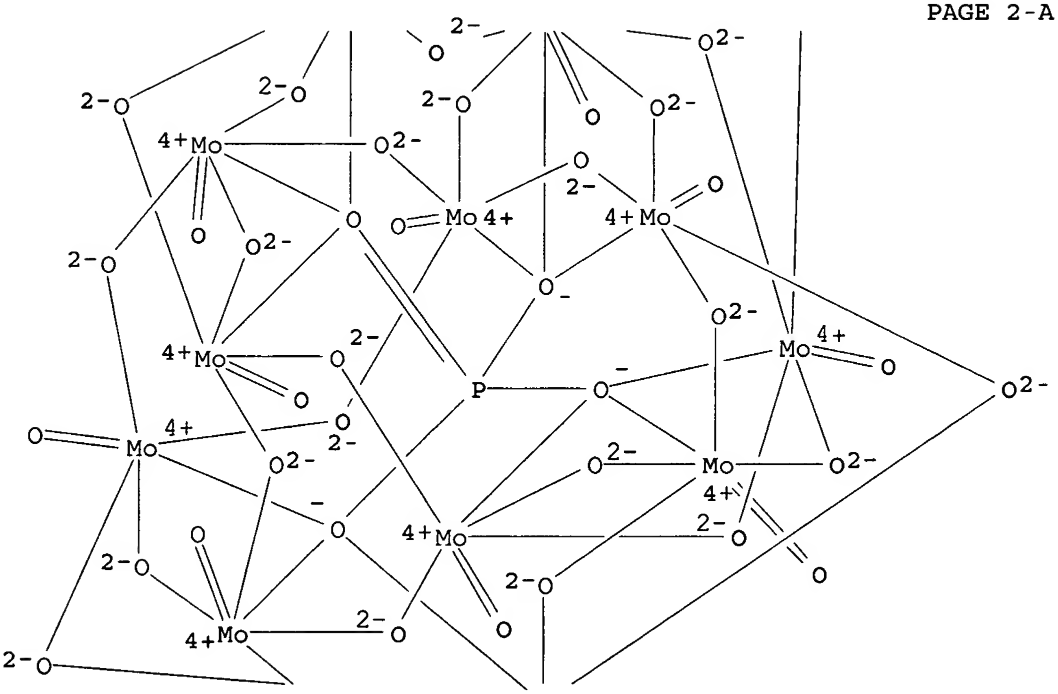
●1/2 Cu(II)

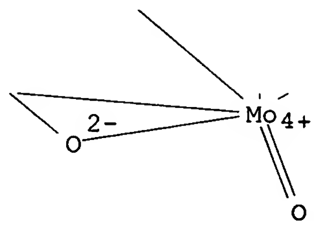
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO
':κO':κO'':κO'':κO'':κO''':κO''':.kapp
a.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A

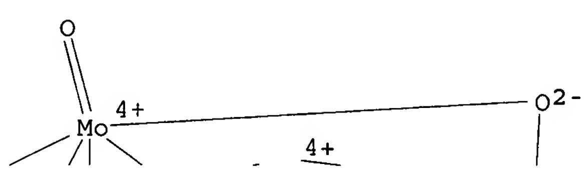




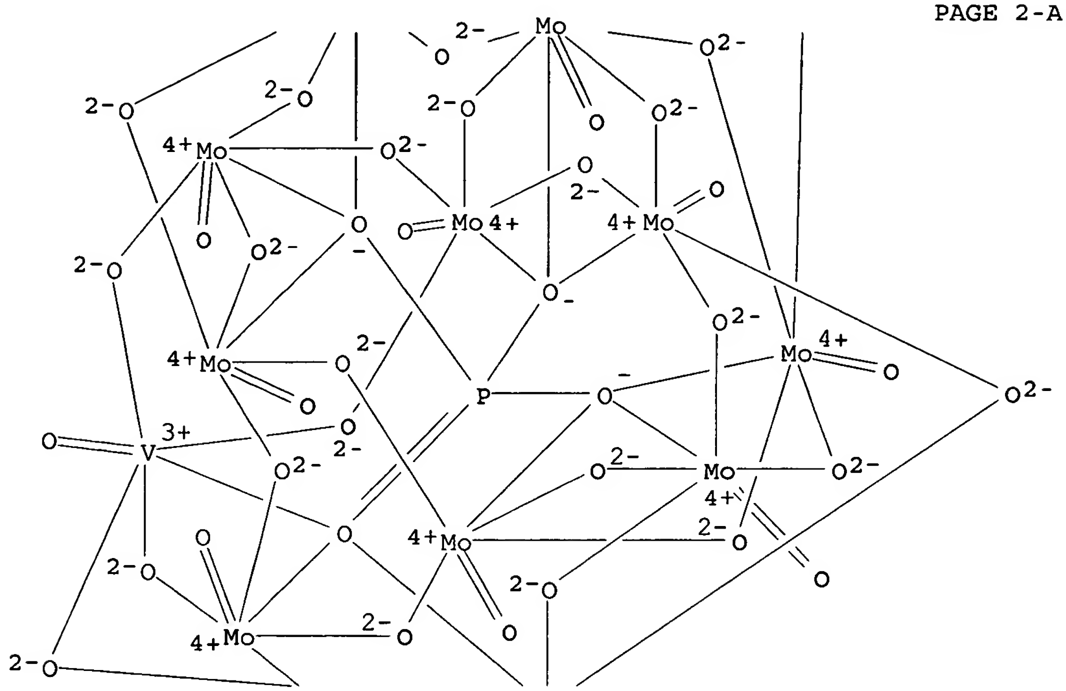
PAGE 3-A

RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa
.O':κO':κO'':κO'':κO'':κO''':κO''':.ka
ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

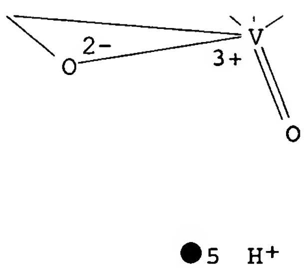
PAGE 1-A



PAGE 2-A

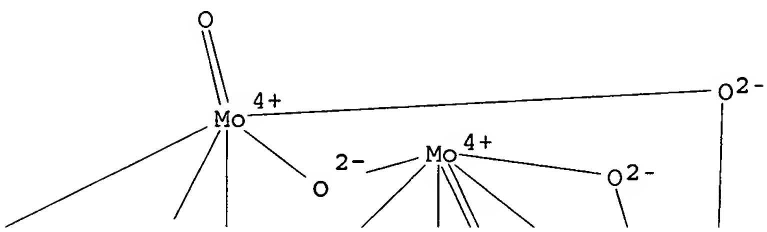


PAGE 3-A

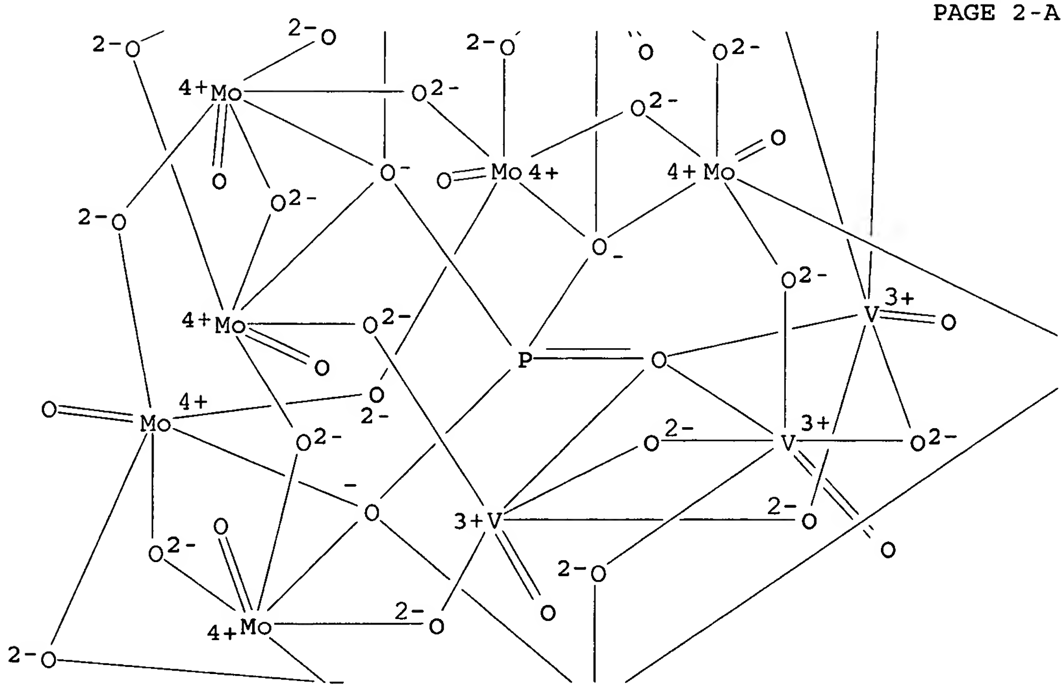


RN 12293-24-2 HCAPLUS
CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

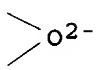
PAGE 1-A



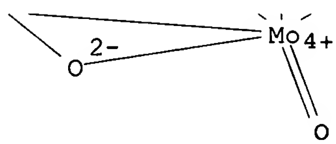
PAGE 2-A



PAGE 2-B



PAGE 3-A



●6 H^+

RE.CNT 39 THERE ARE 39 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 7 OF 29 HCAPLUS

AN 2003:482933 HCAPLUS
DN 139:203248

TI A substrate-versatile catalyst for the selective oxidation of light alkanes II. Catalyst characterization

AU Dillon, Christopher J.; Holles, Joseph H.; Davis, Robert J.; Labinger, Jay A.; Davis, Mark E.
CS Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA

SO Journal of Catalysis (**2003**), 218(1), 54-66
CODEN: JCTLA5; ISSN: 0021-9517
PB Elsevier Science
DT Journal
LA English

AB A highly active and selective catalyst for light alkane oxidation that is composed of a pyridine salt of niobium-exchanged molybdo(vanado)phosphoric acid (NbPMo11(V)pyr) is characterized using TGA-DSC, 31P MAS NMR, and in situ powder XRD, XAS, and XPS. The presence of both niobium and pyridinium species strongly influences structural and redox properties of the **polyoxometalate.** Activation of the catalyst by heating to 420 °C in an inert atmospheric removes all of the organic species present in the solid, and structural rearrangement of the starting **heteropolyanion** occurs at 420 °C as evidenced by 31P NMR and EXAFS. XRD shows that activated NbPMo11Vpyr consisted of a mostly amorphous molybdenum oxide phase, the formation of which is strongly related to the **composition** of the catalyst. The presence of niobium

as an exchange cation (NbO)3+ or a framework atom PMo11NbO404- in the Keggin unit is verified by EXAFS for NbPMo11Vpyr and (VO)PMo11Nbpyr, resp. During activation of either catalyst, niobyl species migrate and most likely coordinate to molybdenum oxide octahedra. Comparison of near-edge electronic spectra (XANES) for as-made NbPMo11Vpyr and after activation that removes the pyridinium ions suggests reduction of Mo6+ to Mo5+ and Nb5+ to Nb4+. Under hydrocarbon-rich reaction mixts. molybdenum and niobium remain in their reduced state.

CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 23, 73

IT **Heteropoly** acids
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(substrate-versatile catalyst for the selective oxidation of light alkanes and catalyst characterization)

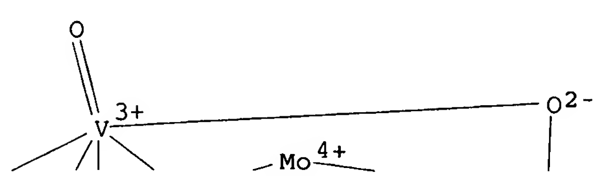
IT 110-86-1D, Pyridine, reaction products with niobium exchanged molybdovanadophosphoric acid and vanadyl exchanged molybdoniobophosphoric acid **12293-15-1D**, niobium exchanged, reaction products with pyridine 583050-33-3D, vanadyl exchanged, reaction products with pyridine
RL: **CAT (Catalyst use)**; PRP (Properties); USES (Uses)
(substrate-versatile catalyst for the selective oxidation of light alkanes and catalyst characterization)

IT **12293-15-1D**, niobium exchanged, reaction products with pyridine
RL: **CAT (Catalyst use)**; PRP (Properties); USES (Uses)
(substrate-versatile catalyst for the selective oxidation of light alkanes and catalyst characterization)

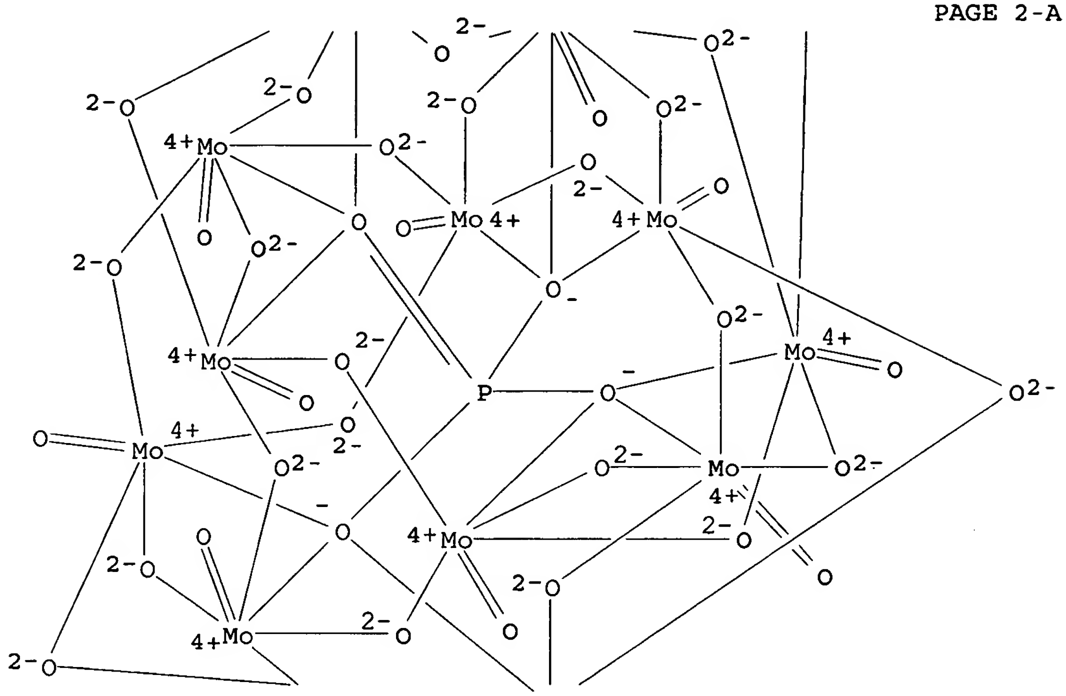
RN 12293-15-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO''':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

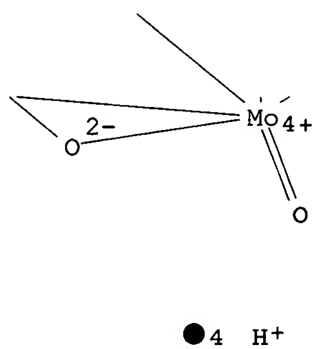
PAGE 1-A



PAGE 2-A



PAGE 3-A



RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 8 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:874201 HCAPLUS
DN 136:21205
TI Production method of catalysts for preparing acetic acid and acetic acid therefrom
IN Oishi, Masakazu; Maki, Etsuo; Uchida, Hiroshi
PA Showa Denko K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent

LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001334149	A2	20011204	JP 2000-155885	20000526 <--
PRAI	JP 2000-155885		20000526		

AB Acetic acid is obtained from reacting ethane and oxygen in the presence of a catalyst comprising (A) palladium, (B) heteropoly acids or their salts, and (C) catalyst support. Thus, KA 1 57.0, disodium palladium tetrachloride 2.2, tetrachloroauric acid tetrahydrate 0.6, zinc chloride 0.11, sodium metasilicate-9 hydrate 6.6, and hydrazine monohydrate 4.6 g were agitated to give palladium metal, sodium telluride, tungstosilicic acid (H4W12O40Si-26H2O), manganese **nitrate** were added to give a catalyst. Ethene 30, oxygen 5, steam 25, and nitrogen 40% were contacted with the catalyst at 285° to give acetic acid.

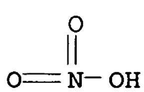
IC ICM B01J027-057
ICS B01J027-199; C07B061-00; C07C051-215; C07C053-08

CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 67

IT 7447-39-4, Copper(II) chloride, uses **10141-05-6**, Cobalt(II) **nitrate** 10377-66-9, Manganese **nitrate** **10421-48-4**, Iron(III) **nitrate** 11104-88-4, Molybdophosphoric acid 11104-89-5, Molybdosilicic acid 12027-38-2 12034-41-2, Sodium telluride 12067-99-1, Tungstophosphoric acid **12293-15-1** **12293-21-9** **12398-73-1** 13548-38-4, Chromium(III) **nitrate** 37280-68-5, Molybdovanadophosphoric acid 55128-39-7, Tungstovanadophosphoric acid 113857-57-1 158293-12-0
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst component; production method of catalysts for preparing acetic acid and acetic acid therefrom)

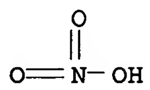
IT **10141-05-6**, Cobalt(II) **nitrate** **10421-48-4**, Iron(III) **nitrate** **12293-15-1** **12293-21-9** **12398-73-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst component; production method of catalysts for preparing acetic acid and acetic acid therefrom)

RN 10141-05-6 HCAPLUS
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



●1/2 Co(II)

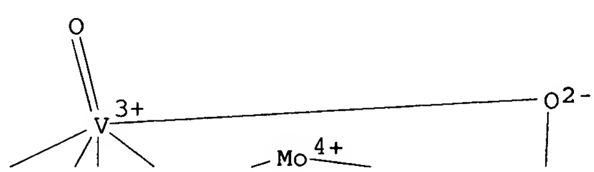
RN 10421-48-4 HCAPLUS
CN Nitric acid, iron(3+) salt (8CI, 9CI) (CA INDEX NAME)



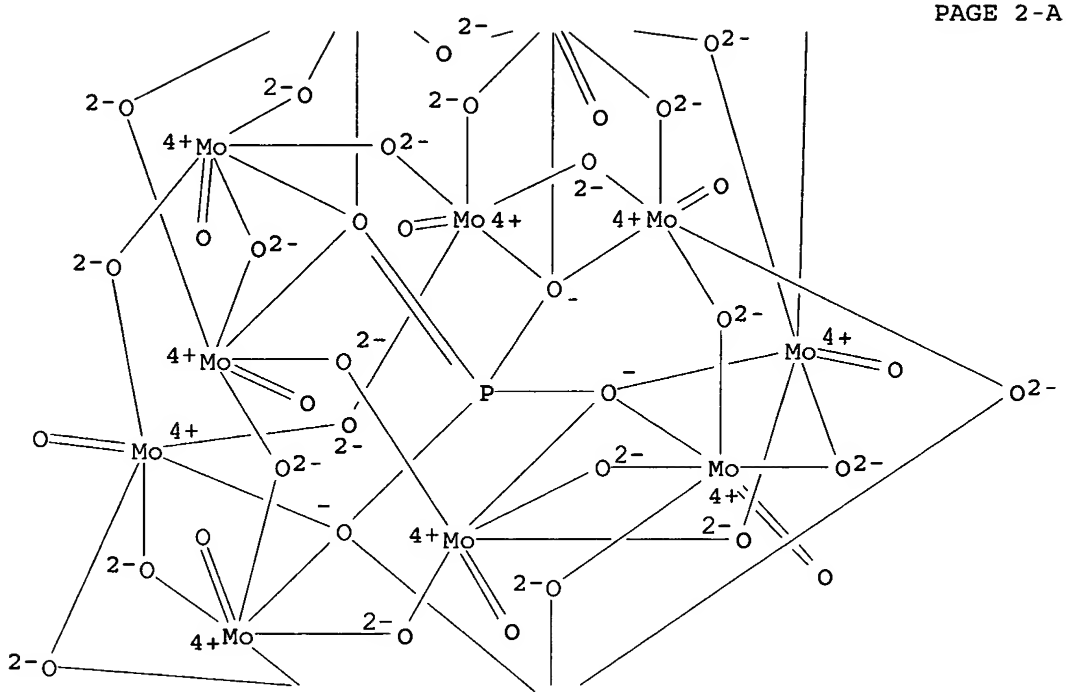
●1/3 Fe(III)

RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

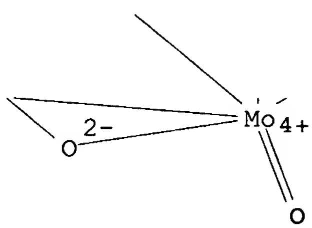
PAGE 1-A



PAGE 2-A



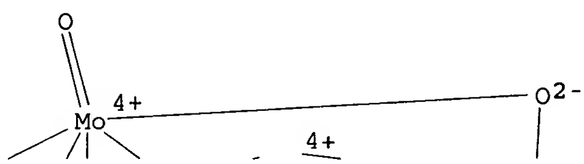
PAGE 3-A



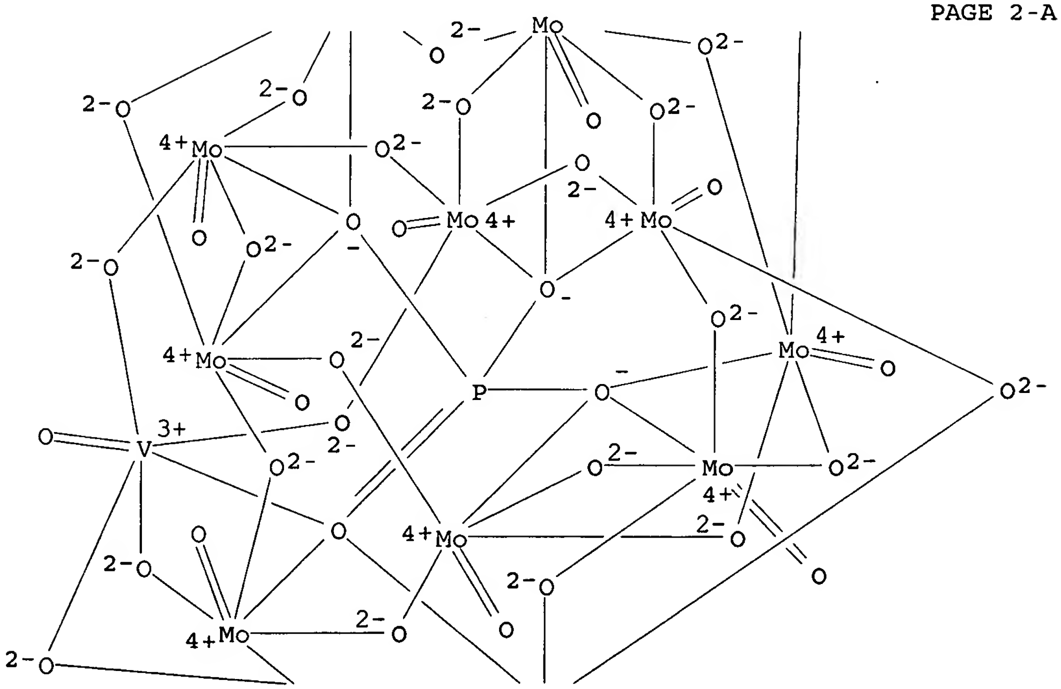
● 4 H^+

RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa
.O':κO':κO'':κO'':κO'':κO''':κO''':.ka
ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

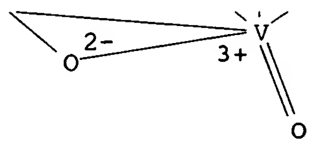
PAGE 1-A



PAGE 2-A



PAGE 3-A

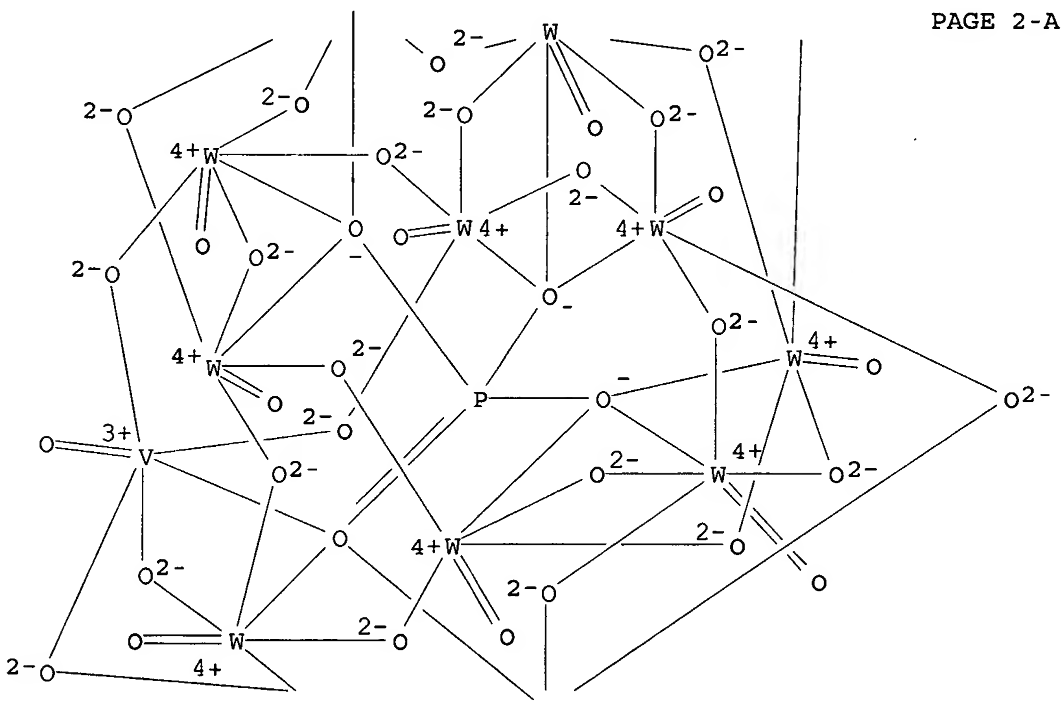


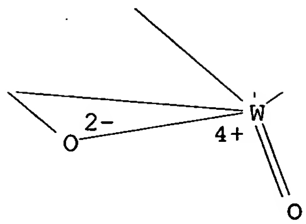
●5 H+

RN 12398-73-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A

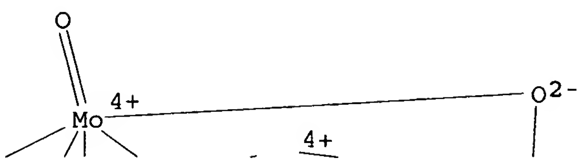




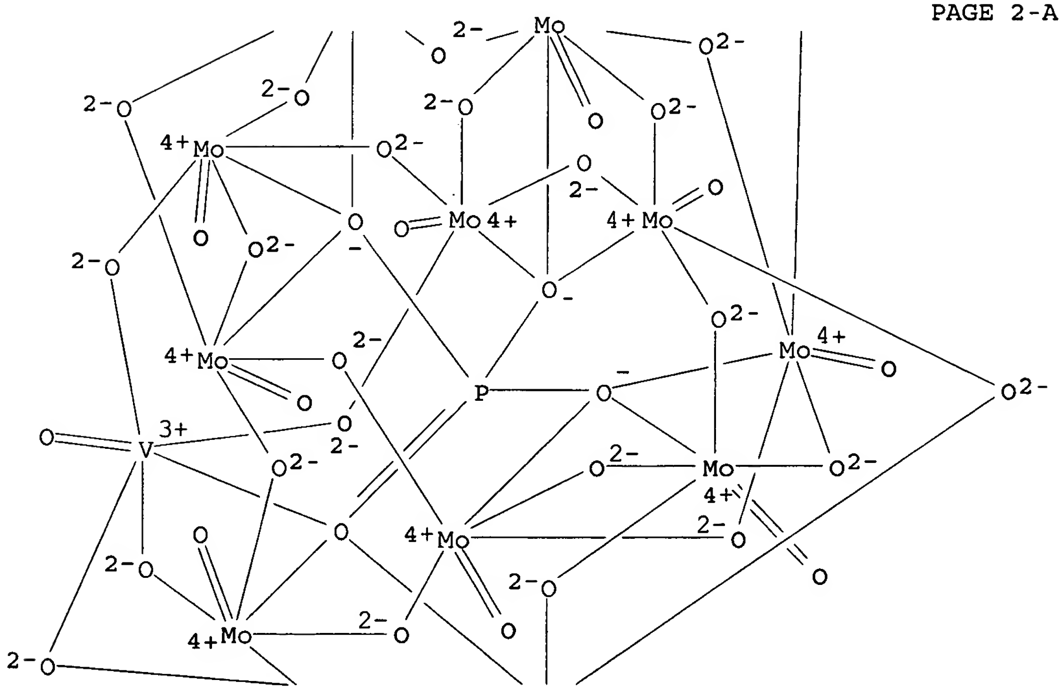
PAGE 3-A

L35 ANSWER 9 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:809504 HCAPLUS
DN 136:134491
TI Ag5PV2Mo10O40, a Heterogeneous Catalyst for Air-Based Selective Oxidation at Ambient Temperature
AU Rhule, Jeffrey T.; Neiwert, Wade A.; Hardcastle, Kenneth I.; Do, Bao T.; Hill, Craig L.
CS Department of Chemistry, Emory University, Atlanta, GA, 30322, USA
SO Journal of the American Chemical Society (**2001**), 123(48), 12101-12102
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society
DT Journal
LA English
OS CASREACT 136:134491
AB The title catalyst was prepared from Na5PV2Mo10O40 and AgNO3 and was used to catalyze the oxidation of 2-chloroethyl Et sulfide to the sulfoxide in the ambient environment (room temperature and 1.0 atm of air). The crystal structure of the catalyst was determined
CC 23-11 (Aliphatic Compounds)
Section cross-reference(s): 75
IT **340737-27-1P**
RL: **CAT (Catalyst use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(Ag5PV2Mo10O40 as heterogeneous catalyst for air-based selective oxidation at ambient temperature)
IT 7761-88-8, Silver **nitrate**, reactions
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(Ag5PV2Mo10O40 as heterogeneous catalyst for air-based selective oxidation at ambient temperature)
IT **340737-27-1P**
RL: **CAT (Catalyst use)**; PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(Ag5PV2Mo10O40 as heterogeneous catalyst for air-based selective oxidation at ambient temperature)
RN 340737-27-1 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentasilver(1+) (9CI) (CA INDEX NAME)

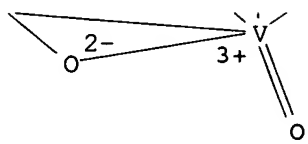
PAGE 1-A



PAGE 2-A



PAGE 3-A



●5 Ag(I)+

RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 10 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2001:545655 HCAPLUS
DN 135:138991
TI Process for the preparation of substituted formamides using catalysts
IN Coulson, Dale Robert; Kourtakis, Kostantinos Dino
PA E. I. Du Pont de Nemours & Co., USA
SO PCT Int. Appl., 24 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001053252	A2	20010726	WO 2001-US2329	20010123 <--
	WO 2001053252	A3	20021128		
	W: BR, CA, DE, GB, IN, JP, KR, MX, PL, RO, SG, TR, US, ZA				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	CA 2390792	AA	20010726	CA 2001-2390792	20010123 <--
	EP 1292565	A2	20030319	EP 2001-942619	20010123 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, RO, CY, TR				
	JP 2003522742	T2	20030729	JP 2001-553258	20010123 <--
	EP 1443037	A1	20040804	EP 2004-76314	20010123 <--
	R: BE, DE, ES, FR, GB, NL				
PRAI	US 2000-177794P	P	20000124		
	EP 2001-942619	A3	20010123		
	WO 2001-US2329	W	20010123		

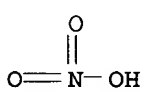
OS MARPAT 135:138991
AB Substituted formamides are prepared by the oxidation of amines in the presence of a xerogel, aerogel, **heteropolyacid**, metal substituted **heteropolyacid**, **heteropolyacid** salt, or metal oxide catalyst. Thus, 47.33 mL 0.349 M magnesium methoxide ethanol solution, 21.776 mL 0.22 M $AuCl_3$ ethanolic solution, and 0.871 mL 0.5 M Chromium hydroxide acetate aqueous solution ($Cr_3(OH)_2$)(acetate)7 were added to realize a gel point, aged for 24 h, dried at 120° for 5 h in vacuum, calcined at 250° in air for 1 h to give a nominal metal **composition** catalyst $Au_{0.025}Cr_{0.025}Mg_{0.95}$.
IC ICM C07C231-10
ICS C07C233-03; B01J027-00
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23
ST aerogel xerogel mixed metal oxide catalyst formamide prepn; **heteropolyacid** catalyst

IT 1313-96-8P, Niobium pentoxide 1314-23-4P, Zirconia, preparation
5593-70-4DP, Titanium n-butoxide, reaction product with mix metal oxides
7646-79-9DP, Cobalt dichloride, reaction product with mix metal oxides
7718-54-9DP, Nickel chloride, reaction product with mix metal oxides
10141-05-6DP, Cobalt **nitrate**, reaction product with mix
metal oxides 10361-44-1DP, Bismuth **nitrate**, reaction product
with mix metal oxides 12027-67-7DP, Ammonium molybdate, reaction product
with mix metal oxides 12648-62-3DP, Ruthenium chloride, reaction product
with mix metal oxides 13463-67-7P, Titania, preparation 23519-77-9DP,
Zirconium n-propoxide, reaction product with mix metal oxides
68335-84-2P 132978-96-2P 179924-76-6P
351421-32-4P 351421-34-6P 351421-36-8P **351421-38-0P**
351421-40-4P 351421-42-6P **351421-44-8P 351421-46-0P**
351421-48-2P
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(process for preparation of substituted formamides using catalysts)

IT **12293-15-1P**
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); RCT
(Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(process for preparation of substituted formamides using catalysts)

IT **10141-05-6DP**, Cobalt **nitrate**, reaction product with mix
metal oxides **68335-84-2P 132978-96-2P**
179924-76-6P 351421-32-4P 351421-38-0P
351421-44-8P 351421-46-0P 351421-48-2P
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP
(Preparation); USES (Uses)
(process for preparation of substituted formamides using catalysts)

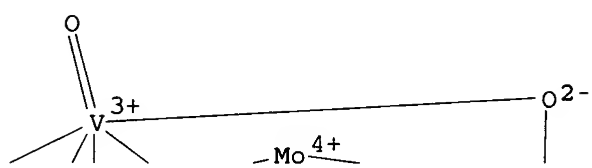
RN 10141-05-6 HCAPLUS
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



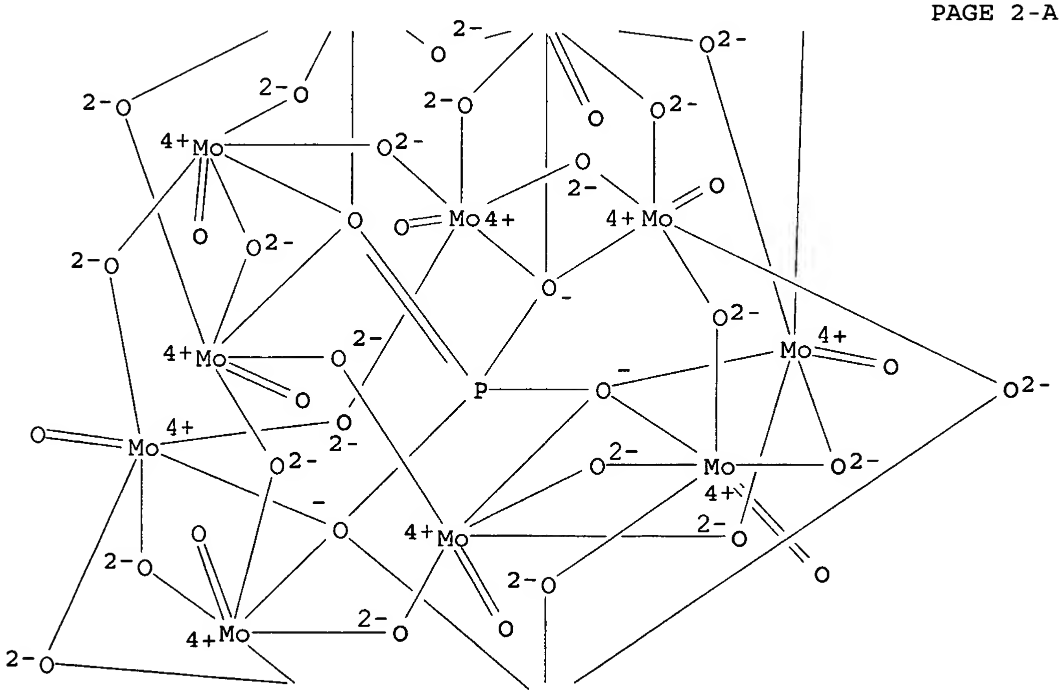
●1/2 Co(II)

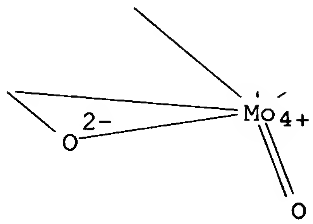
RN 68335-84-2 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-
oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO
':κO':κO'':κO'':κO'':κO''':κO''':.kapp
a.O''']]-, tetracesium (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A





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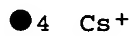
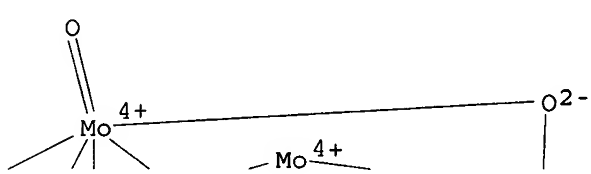


RN 132978-96-2 HCAPLUS
CN Vanadate(7-), [dotriaconta-μ-oxoheptadecaoxo[μ9-[phosphato(3-)-κO:κO:κO:κO':κO':κO'':κO'':.kapp a.O''':κO''']]heptadecamolybdate]tetra-μ-oxooxo[μ9-[phosphato(3-)-κO:κO:κO:κO':κO':κO'':. kappa.O'':κO''':κO''']]-, heptahydrogen (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 179924-76-6 HCAPLUS
CN Vanadate(8-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxooxo(oxocuprate)[μ12-[phosphato(3-)-O:O:O:O':O':O':O'':O'':O'':O''':O ''':O''']]-, octahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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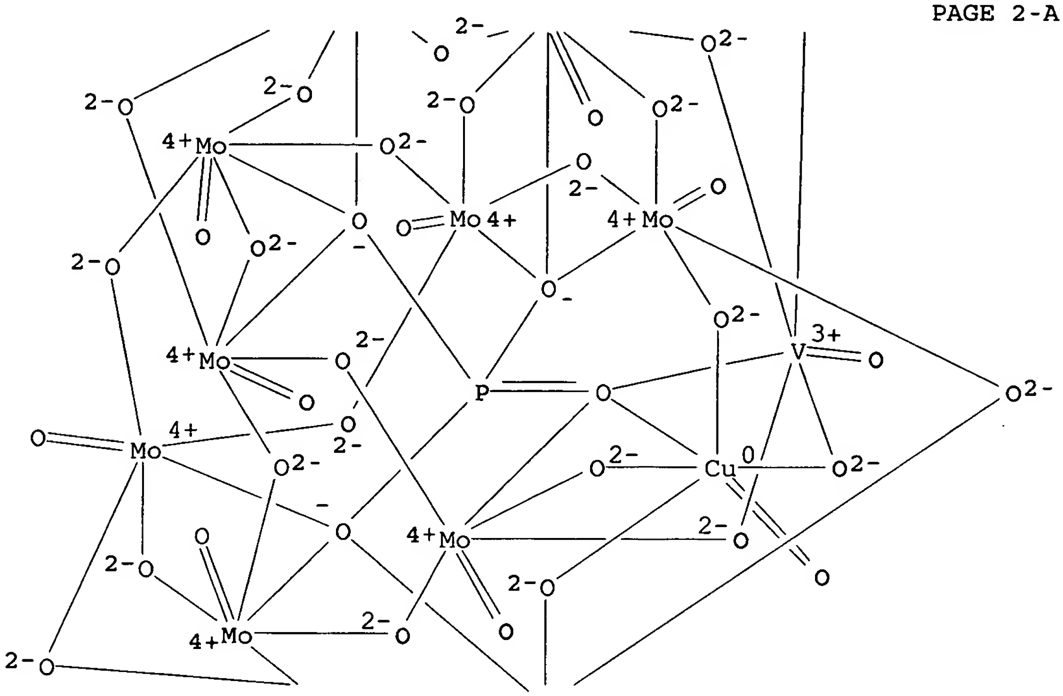
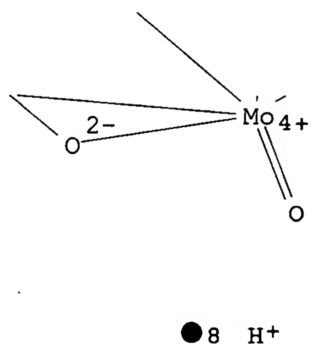
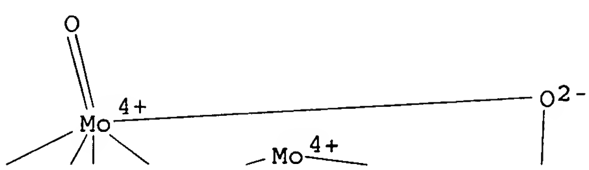


PAGE 3-A



RN 351421-32-4 HCAPLUS
CN Vanadate(9-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxooxo(oxocuprate) [μ12-[phosphato(3-)-κO:κO:κO:.kappa .O':κO':κO':κO'':κO'':κO'':κO''':.kapp a.O''':κO''']]-, nonahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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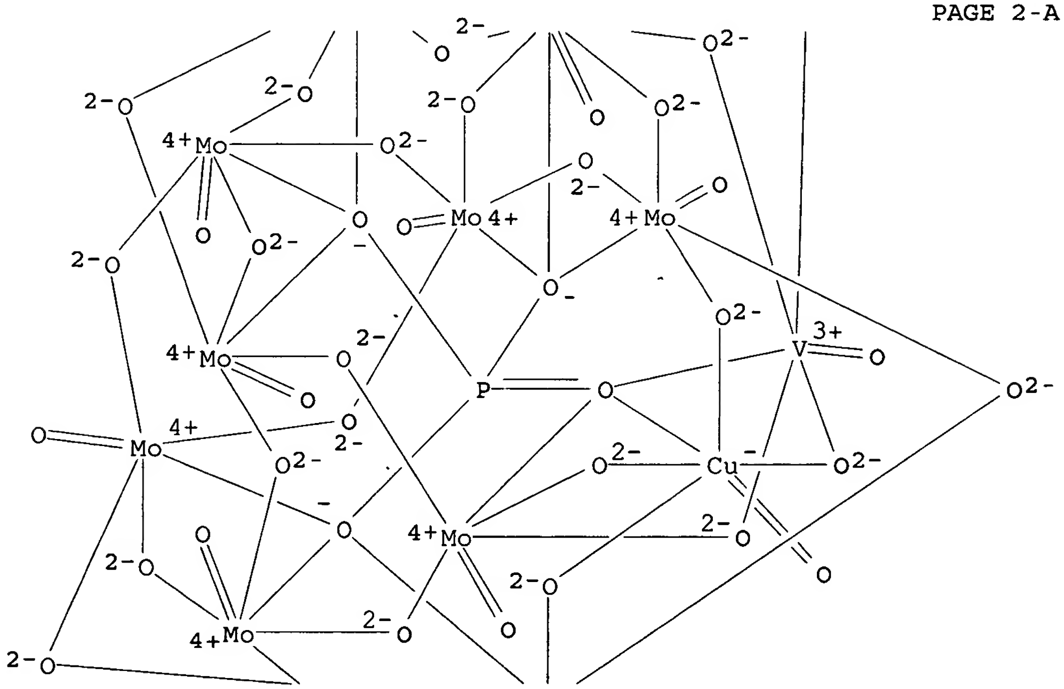
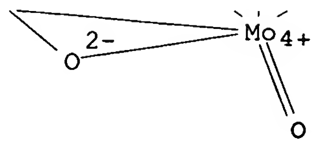
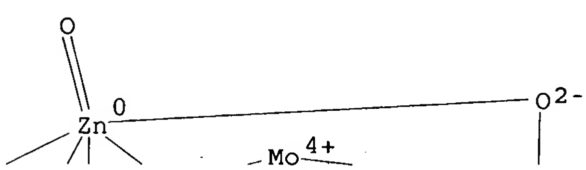


PAGE 3-A



RN 351421-38-0 HCAPLUS
CN Vanadate(8-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxooxo(oxozincate)[μ12-[phosphato(3-)-κO:κO:κO:.kappa.O':κO':κO':κO'':κO'':κO'':O''':κO''':κO''']]-, octahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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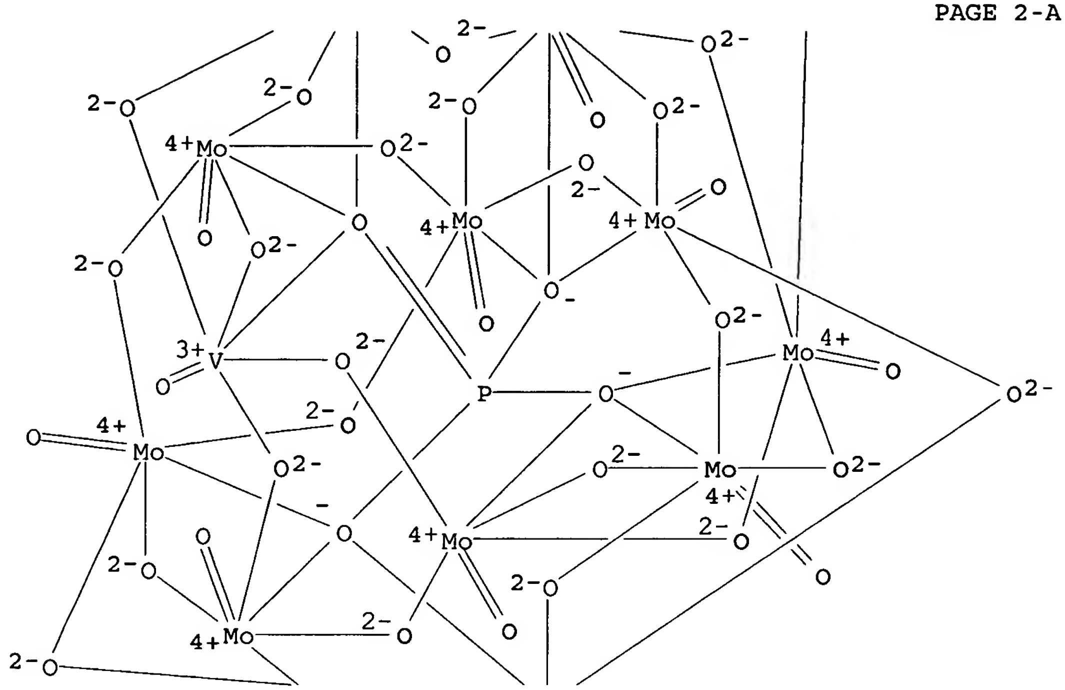

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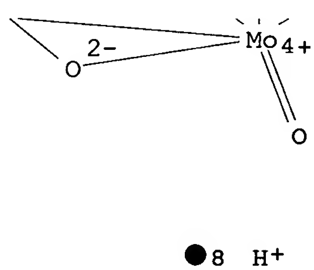
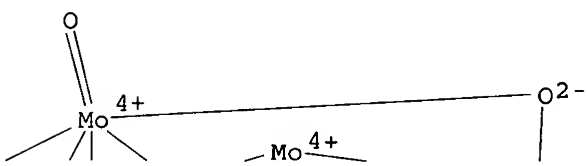


RN 351421-44-8 HCAPLUS
CN Vanadate(9-), nona-μ-oxodioxo(oxocuprate)(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]di-, nonahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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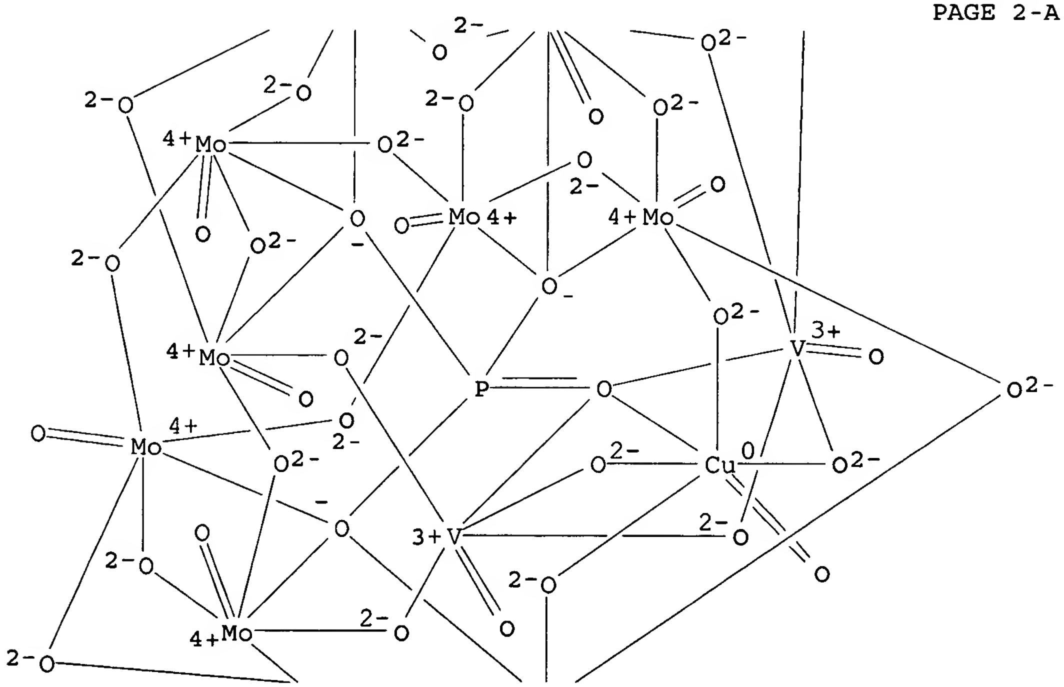

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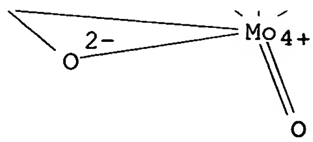
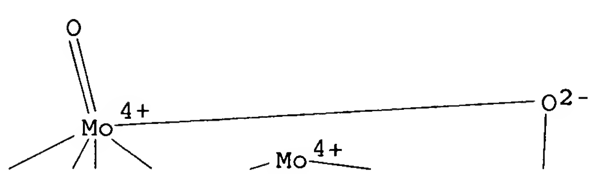


●9 H^+

RN 351421-46-0 HCAPLUS

CN Vanadate(10-), nona-μ-oxodioxo(oxocuprate)(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]di-, decahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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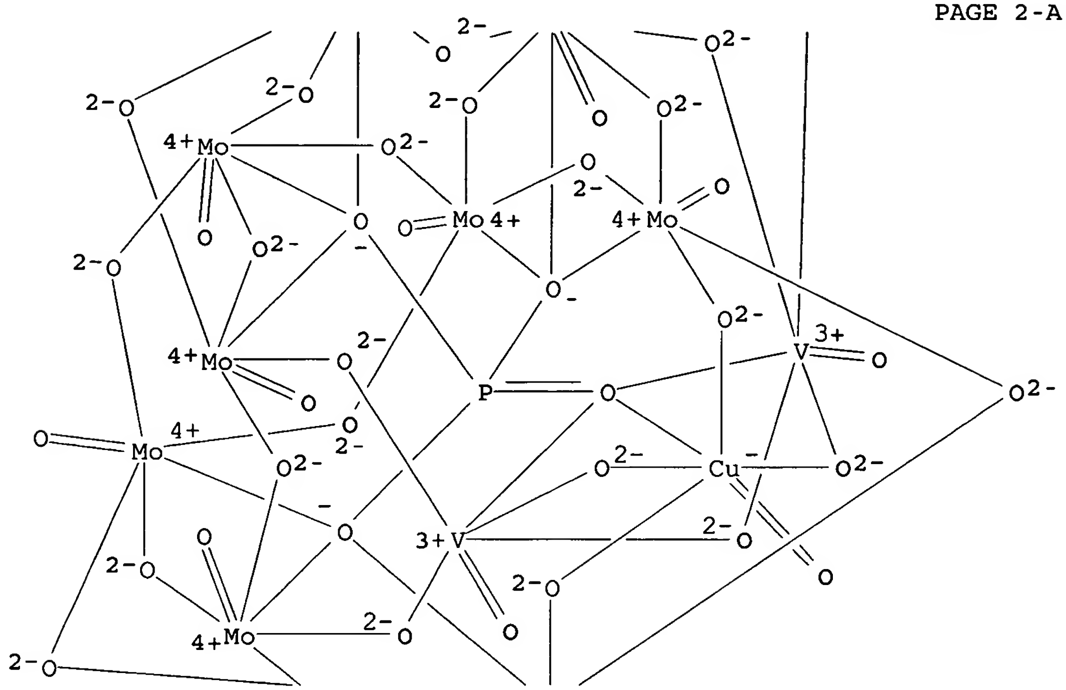
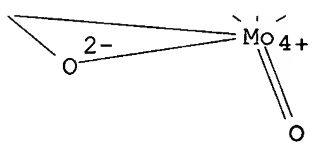


PAGE 3-A

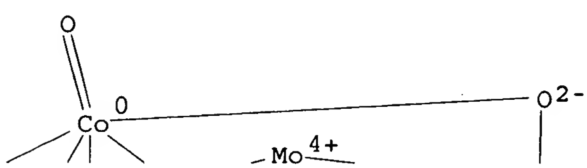


●10 H^+

RN 351421-48-2 HCAPLUS

CN Vanadate(8-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxooxo(oxocobaltate)[μ12-[phosphato(3-)-κO:κO:κO:.kappa.O':κO':κO':κO'':κO'':κO'':O''':κO''':κO''']]-, octahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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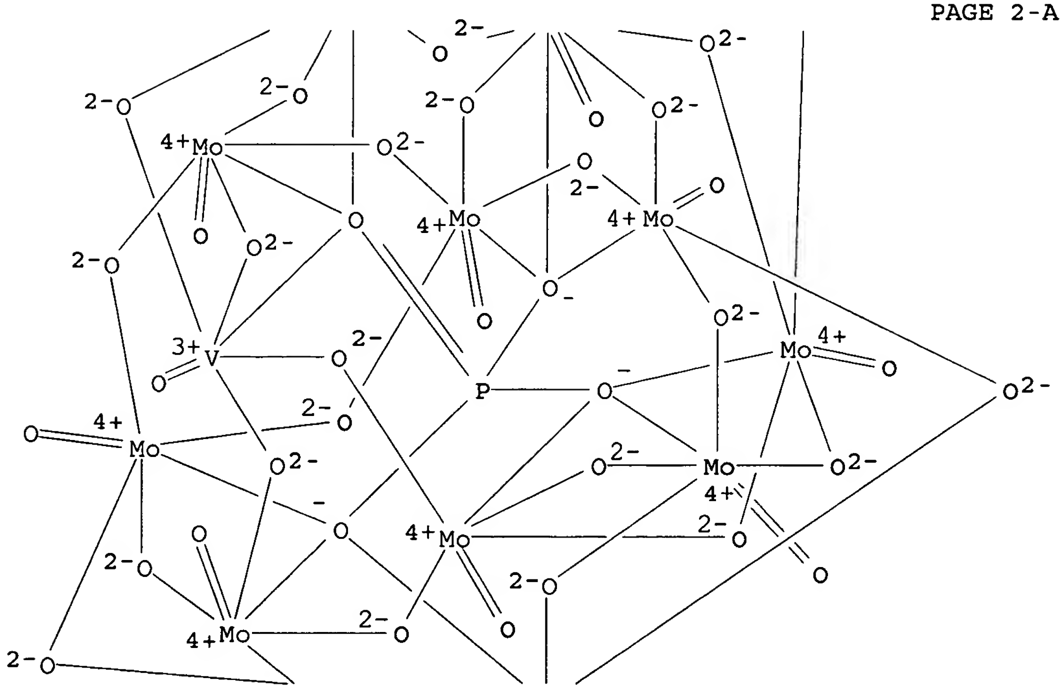
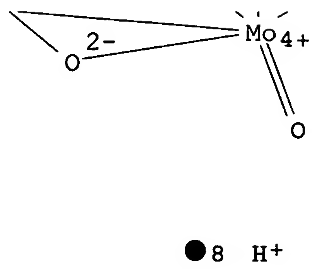


PAGE 3-A

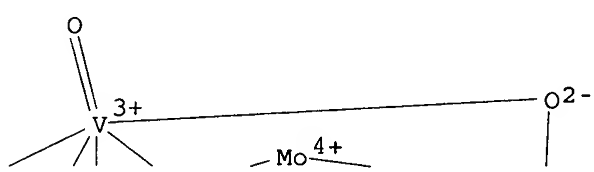


IT 12293-15-1P
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(process for preparation of substituted formamides using catalysts)

RN 12293-15-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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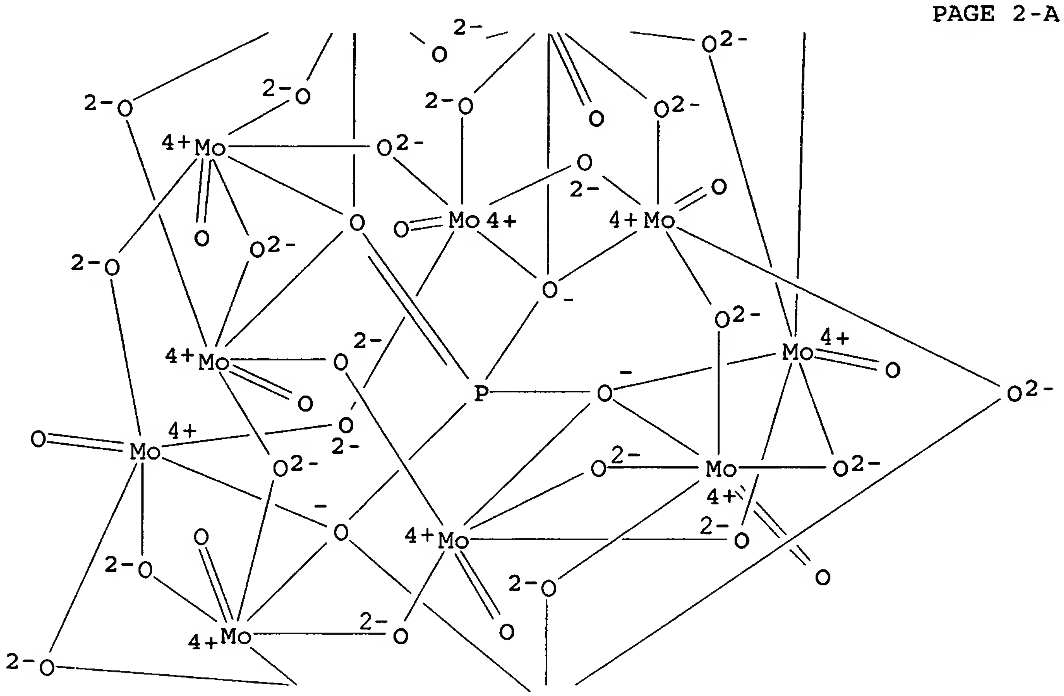

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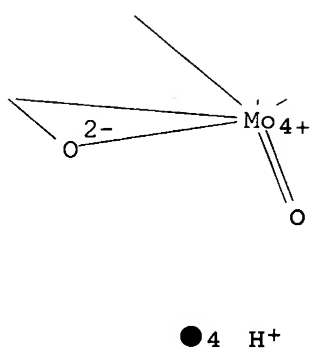


L35 ANSWER 11 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:842046 HCAPLUS
DN 134:30548
TI Equilibrated tungsten-based mixed metal oxide catalyst systems, their preparation and use
IN Reiner, Richard S.; Barbuzzi, Elena M. G.; Weinstock, Ira A.; Hill, Craig L.; Wemple, Michael W.; Cowan, Jennifer J.; Atalla, Rajai H.; Heintz, Robert A.; Bailey, Alan J.
PA Emory University, USA; United States of America, as Represented by the Secretary of Agriculture; Wisconsin Alumni Research Foundation
SO PCT Int. Appl., 127 pp.
CODEN: PIXXD2
DT Patent
LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000071247	A1	20001130	WO 2000-US14511	20000525 <--

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRAI US 1999-136073P P 19990526

AB A homogeneous aqueous solution, useful in wood pulp delignification, comprises ≥1 catalytically or otherwise useful tungsten-based isopoly or **heteropoly** acid complex, present substantially in thermal equilibrium with all chemical species related by reactions between chemical components of the system, of the general formula [VkNbmTanMooWp(TM)q(MG)rOs]z- [TM is a d-electron-containing transition-metal ion; MG is a main-group ion; k = 0-18; m, n = 0-10; o = 0-19; p = 1-150; q, r = 0-9; k < p; m < p; n < p; o < p; p ≥ 1; (k + m + n + o + p) ≥ 4; s is sufficiently large that z > 0], whereby the complex is present at an effective concentration for its intended purpose and all species present within the equilibrated aqueous solution remain dissolved. Because the catalyst is equilibrated under conditions of use, it has an extended useful lifetime. Thus, Na2SiO3 7.695, NaVO3 15.39, Na2WO4.2H2O 15.39, and WO3 66.362 mmol were mixed with 75 mL H2O and heated 3 h at 210° to give a yellow-brown solution with pH 8.25, represented as 0.1M Na6SiV2W10O40 in equilibrium with addnl. NaOH. Delignification of kraft pulp with kappa value 31.8 by use of this solution was carried out through several cycles with intermediate reoxidn. of the solution with stable catalyst activity and pH.

IC ICM B01J021-00
ICS B01J021-02; B01J021-06; B01J023-00; B01J023-16; B01J023-20; B01J023-22; B01J023-28; B01J023-30; D06L003-02; D21C003-00; D21C009-10; D21C009-147; D21C003-04

CC 43-6 (Cellulose, Lignin, Paper, and Other Wood Products)
Section cross-reference(s): 67

ST silicovanadotungstate catalyst wood pulp delignification; **heteropoly** acid complex catalyst; equil **compn** delignification catalyst soln

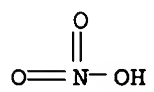
IT **Heteropoly** acids
RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(salts; equilibrated tungsten-based mixed metal oxide catalyst systems for wood pulp delignification)

IT 7631-95-0, Sodium molybdate 7785-87-7, Manganese sulfate **10141-05-6**, Cobalt(II) **nitrate** 27774-13-6, Vanadyl sulfate 137531-01-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of equilibrated tungsten-based mixed metal oxide catalyst systems)

IT **69913-17-3P 244227-05-2P 252254-53-8P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of equilibrated tungsten-based mixed metal oxide catalyst systems targeted at)

IT **10141-05-6**, Cobalt(II) **nitrate**
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of equilibrated tungsten-based mixed metal oxide catalyst

systems)
RN 10141-05-6 HCAPLUS
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)

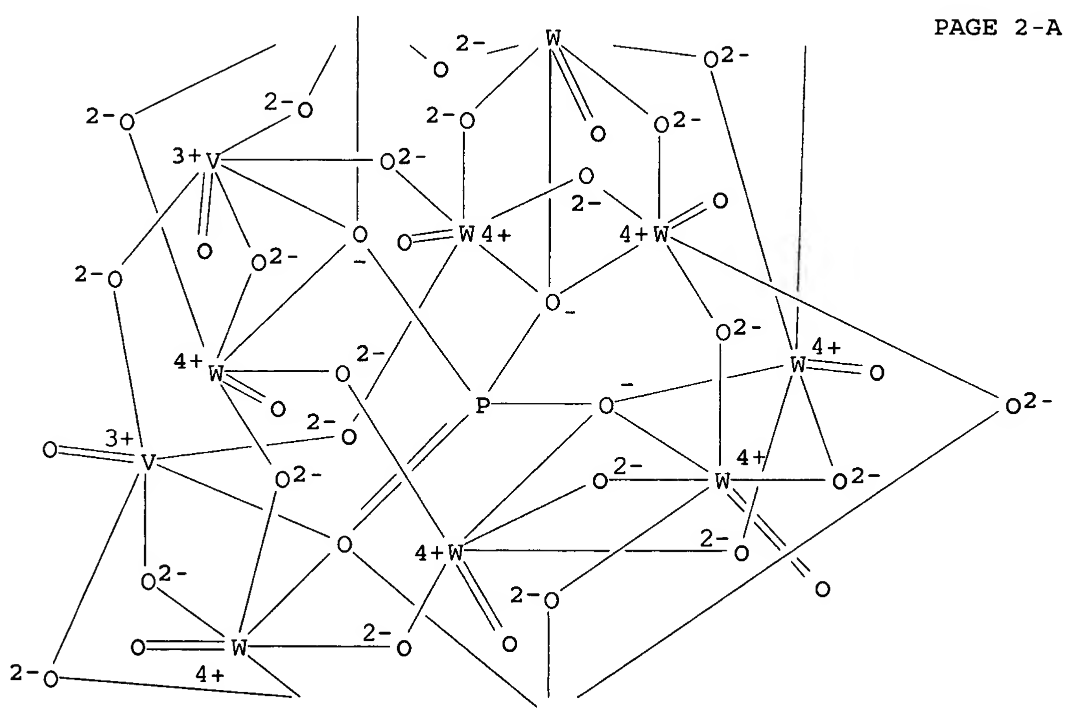


●1/2 Co(II)

IT **69913-17-3P 244227-05-2P 252254-53-8P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of equilibrated tungsten-based mixed metal oxide catalyst systems targeted at)
RN 69913-17-3 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecatungstate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentasodium (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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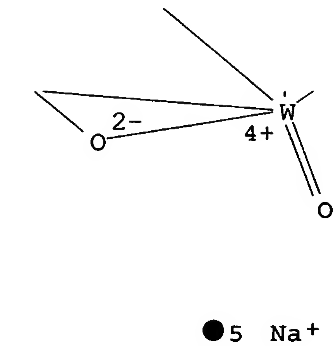

RN 244227-05-2 HCAPLUS
CN Vanadate(6-), (heptadeca-μ-oxodecaoxodecatungstate)[μ12-[orthosilicato(4-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':κO''']]hepta-μ-oxodioxodi-, hexasodium (9CI) (CA INDEX NAME)

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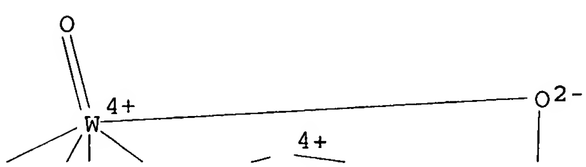

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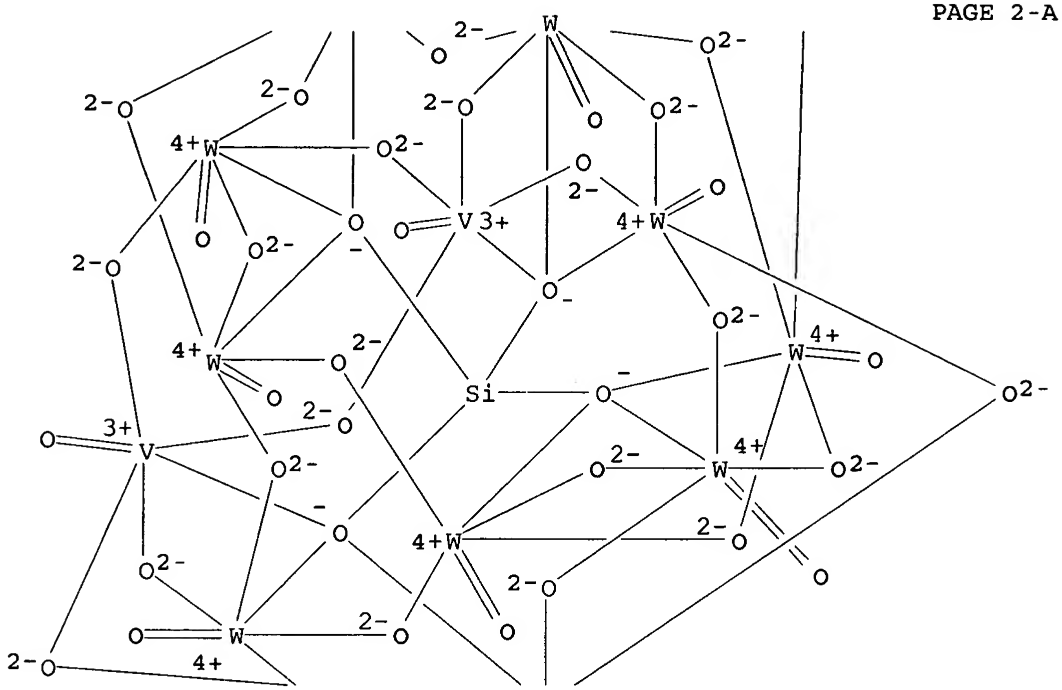

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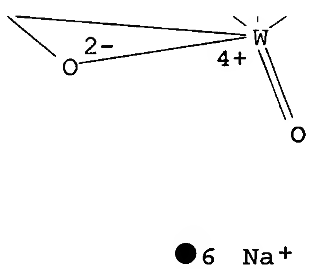
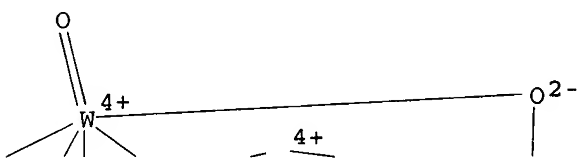
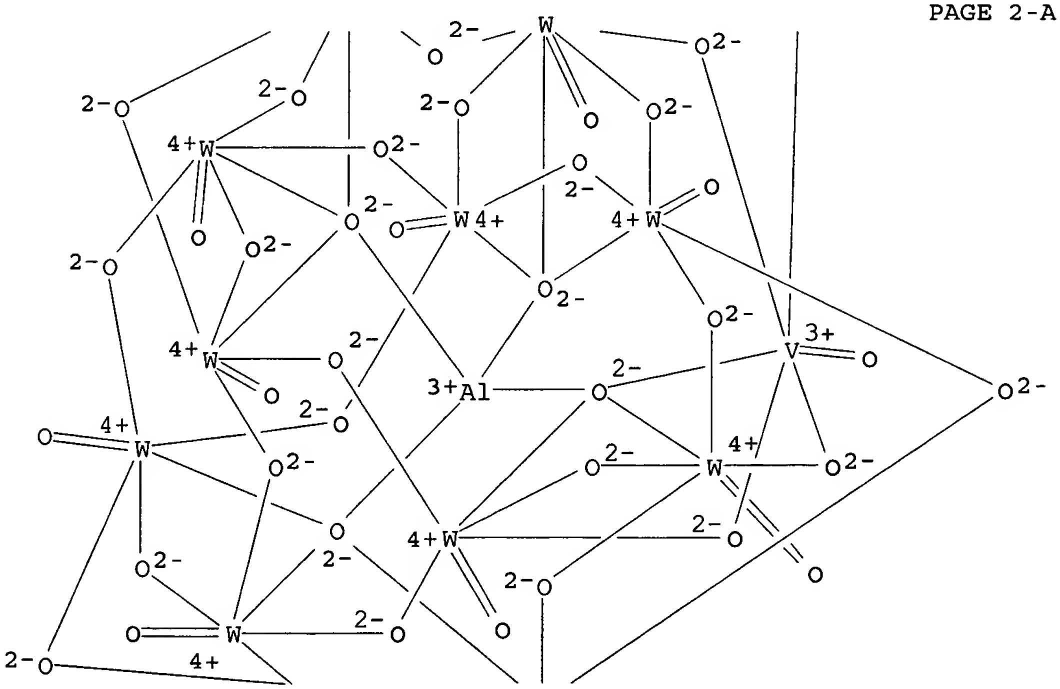


RN 252254-53-8 HCAPLUS
CN Vanadate(6-), aluminate(eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxotetra-μ4-oxooxo-, hexasodium (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



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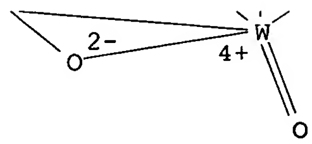


●6 Na+

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 12 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:584627 HCAPLUS
DN 133:334930
TI Study of ammonium, mixed ammonium-cesium and cesium salts derived from (NH4)5[PMo11VIVO40] as isobutyric acid oxidation catalysts. Part II. Synthesis, characterization and catalytic activity in the oxidative dehydrogenation of isobutyric acid of mixed ammonium-cesium and cesium salts
AU Marchal-Roch, C.; Laronze, N.; Guillou, N.; Teze, A.; Herve, G.
CS Institut de Reactivite, Electrochimie et Microporosites, UMR CNRS 8637, Universite de Versailles, Versailles, 78035, Fr.
SO Applied Catalysis, A: General (**2000**), 203(1), 143-150
CODEN: ACAGE4; ISSN: 0926-860X
PB Elsevier Science B.V.
DT Journal
LA English
AB Thermal exchange of Cs for NH4+ cations in (NH4)5[PMo11VIVO40] impregnated at incipient wetness by CsNO3 was performed under N. The structural modification of this salt, previously reported in the Part I of this work, limits the solid state exchange to three Cs per heteropolyanion. Mixed NH4+, Cs+ and VO2+ salts, isotype of the cubic NH4+ and Cs 12-molybdophosphates, are obtained. The characterizations of these low surface area compds. show that their formula is Cs2x(NH4)6-2x(VO)[PMo11VIVO40][PMo12O40], with 0≤x≤3. These compds. are active for oxidative dehydrogenation of the isobutyric acid and selective to methacrylic acid. Characterizations of the catalysts corresponding to x<3 after reaction reveal a loss of NH3 and a quant. release of V from the heteropolyanion. Above x = 3, the samples which are inactive, are composed of the oxidized mixed Cs and V salt Cs6(VO2)[PMo11VVO40][PMo12O40] and an excess of CsNO3. Like for the mixed NH4+-Cs 12-molybdophosphates, the best catalyst is the nearly stoichiometric Cs salt (x = 3) which is stable in the conditions of the reaction. The presence of V improves significantly both the catalytic activity and the selectivity to methacrylic acid.
CC 22-7 (Physical Organic Chemistry)
IT 276679-72-2 **276867-29-9** 304432-68-6 304432-70-0
304432-72-2 304432-74-4
RL: **CAT (Catalyst use)**; PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(preparation, characterization, and catalytic activity of mixed ammonium-cesium and cesium salts [derived from (NH4)5[PMo11VIVO40]] in oxidative dehydrogenation of isobutyric acid)
IT 7789-18-6, Cesium **nitrate**

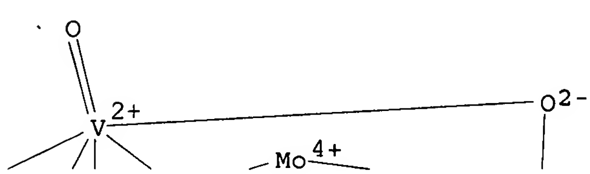
RL: CAT (Catalyst use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(preparation, characterization, and catalytic activity of mixed ammonium-cesium and cesium salts [derived from (NH4)5[PMo11VIVO40]] in oxidative dehydrogenation of isobutyric acid)

IT **276867-29-9**
RL: **CAT (Catalyst use)**; PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(preparation, characterization, and catalytic activity of mixed ammonium-cesium and cesium salts [derived from (NH4)5[PMo11VIVO40]] in oxidative dehydrogenation of isobutyric acid)

RN 276867-29-9 HCAPLUS

CN Vanadate(5-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, pentaammonium (9CI) (CA INDEX NAME)

PAGE 1-A



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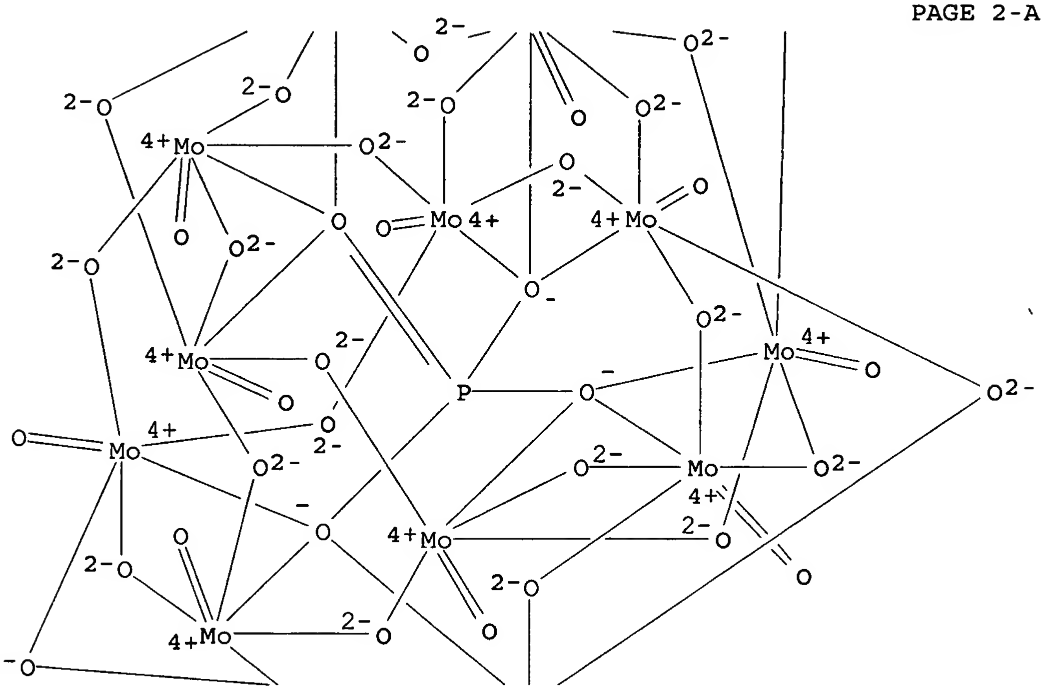
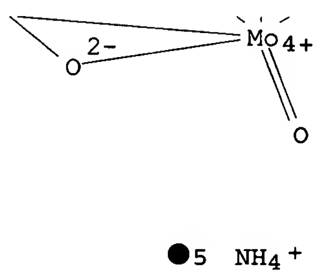


PAGE 3-A



RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 13 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:486633 HCAPLUS
DN 133:95080
TI Catalytic hydroxylation of phenol by Fe-base composite metal oxide
AU Long, Zhonghua
CS Chemical Plant, Gaoqiao Petrochemical Co., Shanghai, Peop. Rep. China
SO Gaoqiao Shihua (2000), 15(3), 14-15, 18
CODEN: GASHFE
PB Gaoqiao Shihua Gongsi Kejichu
DT Journal
LA Chinese
AB Title Fe-base composite metal oxide was prepared by copptn. and used as catalyst for the hydroxylation of phenol. The catalysis underwent an inducing period first, and a little of HOAc can shorten the inducing

period effectively. The reaction rate was quick, and the selectivity of dihydroxybenzene was high. The catalytic mechanism of the catalyst was discussed.
CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
IT 1309-37-1P, Iron oxide (Fe2O3), uses 1309-48-4P, Magnesium oxide (MgO), uses 7439-89-6DP, Iron, reaction products with ammonia, magnesium **nitrate**, and silica, uses 7439-95-4DP, Magnesium, reaction products with ammonia, iron **nitrate**, and silica, uses 7631-86-9DP, Silica, reaction products with ammonia, magnesium **nitrate**, and iron **nitrate**, uses 7664-41-7DP, Ammonia, reaction products with iron **nitrate**, magnesium **nitrate** , and silica, uses 108148-02-3P, Copper lanthanum strontium oxide (CuLa1.9Sr0.1O4) **175162-45-5P**
RL: **CAT (Catalyst use)**; PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(catalytic hydroxylation of phenol by Fe-base composite metal oxide)
IT **175162-45-5P**
RL: **CAT (Catalyst use)**; PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)
(catalytic hydroxylation of phenol by Fe-base composite metal oxide)
RN 175162-45-5 HCAPLUS
CN Pyridinium, 1-hexadecyl-, [nonaconta-μ-oxohexadecaoxo[μ9-[phosphato(3-)-κO:κO:κO:κO':κO':κO'':.kappa.O'':κO''':κO''']]hexadecamolybdate]hepta-μ-oxodioxo[μ9-[phosphato(3-)-κO:κO:κO:κO':κO':κO'':κO'':κO''':κO''']]divanadate(8-) (8:1) (9CI) (CA INDEX NAME)

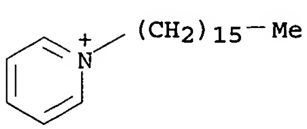
CM 1

CRN 120384-94-3
CMF Mo16 O62 P2 V2
CCI CCS

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CM 2

CRN 7773-52-6
CMF C21 H38 N



L35 ANSWER 14 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:316959 HCAPLUS
DN 132:334224
TI Preparation of cyanoacetic acid esters
IN Obana, Yoshiaki; Arai, Norihide; Uchida, Hiroshi
PA Showa Denko K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000136175	A2	20000516	JP 1998-311204	19981030 <--
PRAI	JP 1998-311204		19981030		

OS CASREACT 132:334224; MARPAT 132:334224

AB Title compds. are prepared by reaction of RCH:CHCN (R = H, OR1; R1 = C1-5 linear or branched alkyl) with alcs. and oxidizing agents in the presence of catalysts. CH2:CHCN was reacted with MeOH and O in the presence of PdCl2 and CuCl2 at 60° under 0.2 MPa for 2 h to give 6% Me cyanoacetate.

IC ICM C07C253-30
ICS B01J027-13; B01J027-25; B01J031-28; C07C255-19; C07B061-00

CC 23-19 (Aliphatic Compounds)

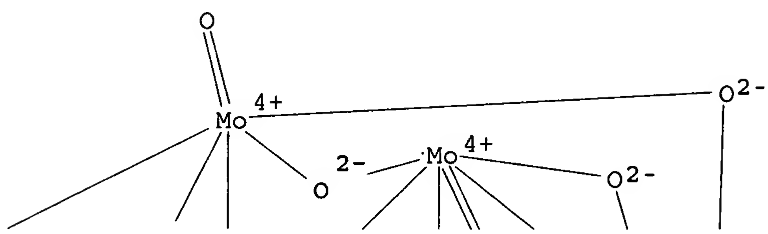
IT 3375-31-3 7447-39-4, Cupric chloride, uses 7647-10-1, Palladium chloride 10102-05-3, Palladium **nitrate** 12026-57-2, Phosphomolybdic acid (H3PMo12O40) **12293-24-2**, Phosphovanadomolybdic acid (H6PV3Mo9O40) **89192-42-7** 267418-57-5, Phosphovanadomolybdic acid cesium salt (Cs3H3PV3Mo9O40) 267418-58-6, Phosphovanadotungstomolybdic acid manganese salt (MnHPW2Mo10O40)
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst; preparation of cyanoacetic acid esters by oxidation of acrylonitriles with alcs. and O)

IT **12293-24-2**, Phosphovanadomolybdic acid (H6PV3Mo9O40)
89192-42-7
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst; preparation of cyanoacetic acid esters by oxidation of acrylonitriles with alcs. and O)

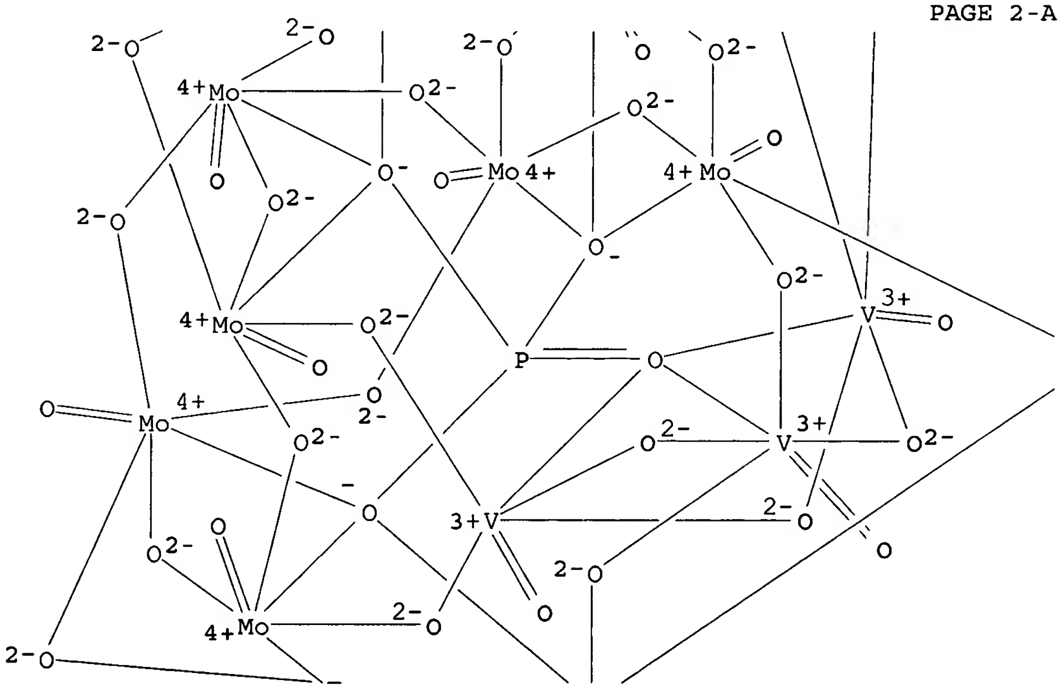
RN 12293-24-2 HCAPLUS

CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa .O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



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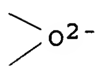

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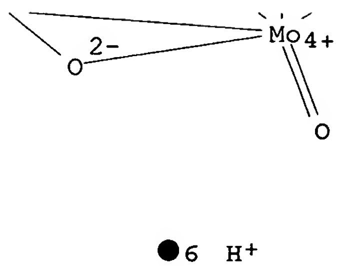
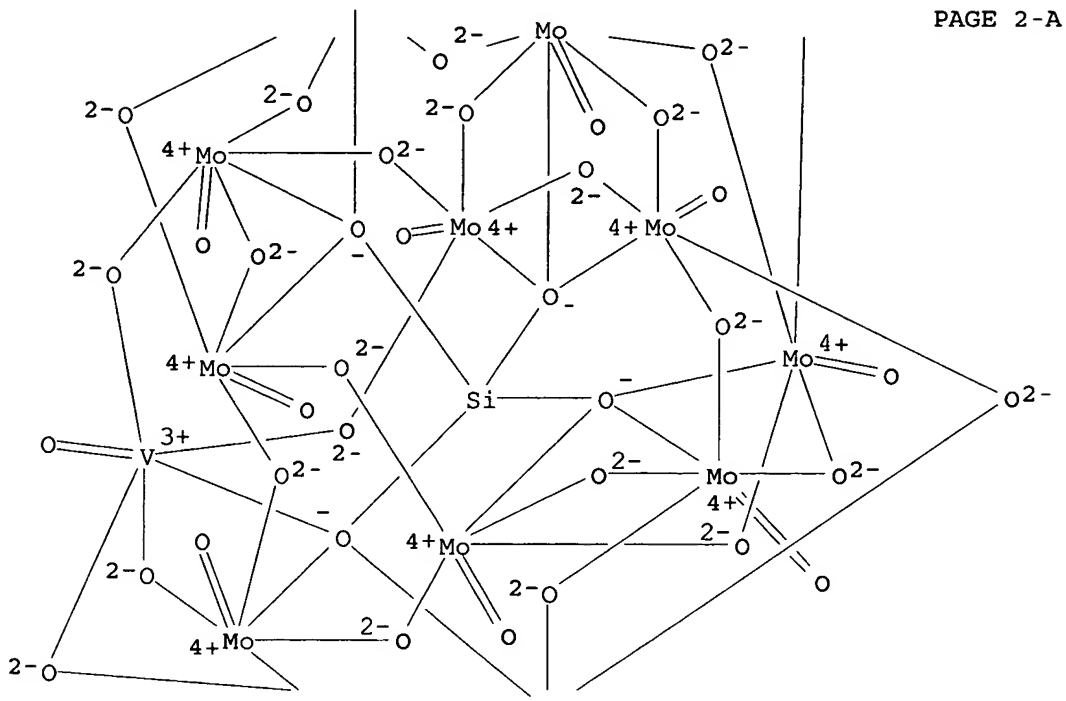


RN 89192-42-7 HCAPLUS
CN Vanadate(5-), (eicosa-μ-oxoundecaoxoundecamolybdate)[μ12-[orthosilicato(4-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-μ-oxooxo-, pentahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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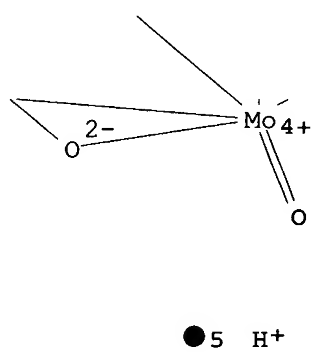


L35 ANSWER 15 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2000:252736 HCAPLUS
DN 133:64519
TI Study of ammonium, mixed ammonium-cesium and cesium salts derived from (NH4)5[PMo11VIVO40] as isobutyric acid oxidation catalysts. Part I: Syntheses, structural characterizations and catalytic activity of the ammonium salts
AU Marchal-Roch, C.; Laronze, N.; Guillou, N.; Teze, A.; Herve, G.
CS UMR 8637, Institut de Reactivite, Electrochimie et Microporosites, Universite de Versailles, Versailles, 78035, Fr.
SO Applied Catalysis, A: General (**2000**), 199(1), 33-44
CODEN: ACAGE4; ISSN: 0926-860X
PB Elsevier Science B.V.
DT Journal

LA English

AB The ammonium salt of the 1-vanado-11-molybdophosphate in which vanadium is at the oxidation state IV was synthesized in order to obtain the mixed ammonium-cesium and pure cesium salts by thermal Cs+/NH4+ solid state exchange. Study of its thermal behavior showed that a phase, named phase A, isotype with the cubic phase of (NH4)3[PMo12O40] is obtained and is stable up to 410°C. This phase A contains two different Keggin **heteropolyanions**, [PMo11VIVO40]5- and [PMo12O40]3- in equal quantities and, in addition to the ammonium cations, vanadyl cations balance the supplementary neg. charges of the vanadium containing **heteropolyanion.** Its mol. **composition is** (NH4)6(VO)[PMo11VIVO40][PMo12O40]. This phase has a low surface area (11 m2/g), on the contrary of the ammonium cubic phase of (NH4)3[PMo12O40] obtained by precipitation from aqueous solns. of the **heteropolyacid.** But it is about twice more active in the oxidative dehydrogenation of isobutyric acid and more selective to methacrylic acid, as it is expected from previous studies on vanadyl salts. Thermal Cs+/NH4+ exchanges performed on the phase A are not complete and cannot be carried out without structural modifications.

CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 23, 35, 45

ST ammonium **heteropoly** acid salt synthesis characterization; isobutyric acid oxidn catalyst ammonium **heteropoly** acid salt

IT **Heteropoly** acids
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(study of ammonium, mixed ammonium-cesium and cesium salts derived from (NH4)5[PMo11VIVO40] as isobutyric acid oxidation catalysts and syntheses, structural characterizations and catalytic activity of ammonium salts)

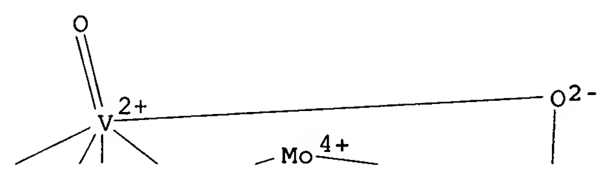
IT **276867-29-9P**
RL: **CAT (Catalyst use)**; PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(study of ammonium, mixed ammonium-cesium and cesium salts derived from (NH4)5[PMo11VIVO40] as isobutyric acid oxidation catalysts and syntheses, structural characterizations and catalytic activity of ammonium salts)

IT **276867-29-9P**
RL: **CAT (Catalyst use)**; PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(study of ammonium, mixed ammonium-cesium and cesium salts derived from (NH4)5[PMo11VIVO40] as isobutyric acid oxidation catalysts and syntheses, structural characterizations and catalytic activity of ammonium salts)

RN 276867-29-9 HCAPLUS

CN Vanadate(5-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, pentaammonium (9CI) (CA INDEX NAME)

PAGE 1-A



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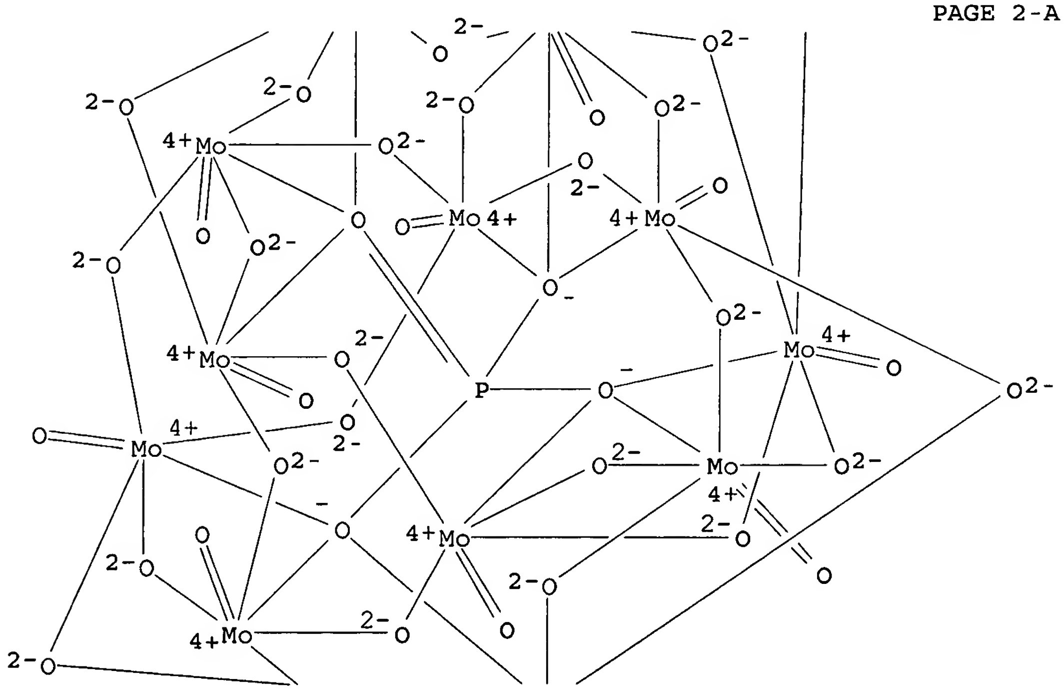
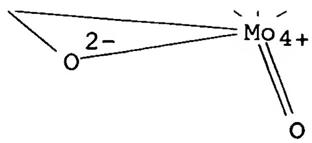


PAGE 3-A



● 5 NH_4^+

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 16 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1999:189254 HCAPLUS
DN 130:239049
TI Transition-metal substituted tungstoaluminate complexes for delignification and waste mineralization
IN Weinstock, Ira A.; Cowan, Jennifer J.; Reiner, Richard S.; Hill, Craig L.
PA United States Dept. of Agriculture, USA; Emory University
SO PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	WO 9911857	A1	19990311	WO 1998-US18462	19980904	<--
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM					
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG					
	CA 2301719	AA	19990311	CA 1998-2301719	19980904	<--
	AU 9892213	A1	19990322	AU 1998-92213	19980904	<--
	EP 1017899	A1	20000712	EP 1998-944749	19980904	<--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI					
	BR 9812135	A	20000718	BR 1998-12135	19980904	<--
	JP 2003514127	T2	20030415	JP 2000-508848	19980904	<--
	ZA 9808145	A	19990630	ZA 1998-8145	19980907	<--
PRAI	US 1997-58000P	P	19970905			
	US 1998-145504	A	19980902			
	WO 1998-US18462	W	19980904			

AB A method of delignifying lignocellulosic fibers is disclosed. In one embodiment, the method comprises the steps of combining a polyoxometalate complex with Al heteroatom of the formula [Al1VmMonWoNbpTaq(TM)rOs]x- where 1 is 1-6, m is 0-18, n is 0-40, o is 0-40, p is 0-10, q is 0-10, r is 0-9, and TM is a d-electron-containing transition metal ion, where l+m+n+o+p+q 4, and s is sufficiently large that x > 0, with a lignocellulosic pulp, wherein the pH of the combination is between 6 and 11 and the consistency of the combination is 1-20%; and heating the combination in a temperature-controlled and pressure-controlled vessel under conditions of temperature and time wherein the polyoxometalate is reduced and

delignification occurs. Bleaching of wood pulp with [AlVW11O40]6- was demonstrated under several sets of conditions. A useful characteristic of [AlVW11O40]6- is that its reduction potential is sufficiently neg. such that the reduced form of the anion, [AlVW11O40]7-, can be readily oxidized by O.

IC ICM D21C009-10

CC 43-6 (Cellulose, Lignin, Paper, and Other Wood Products)

IT **221275-85-0P** **221275-87-2P** 221275-89-4P 221275-91-8P 221275-93-0P 221275-95-2P
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(delignification catalysts; manufacture of transition-metal substituted tungstoaluminate complexes for delignification and waste mineralization)

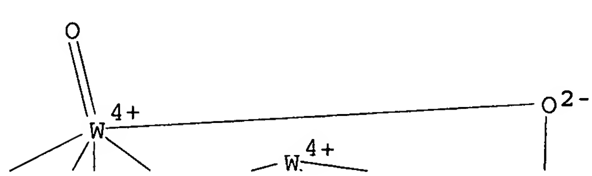
IT 584-08-7 7785-87-7, Manganese sulfate **10141-05-6**, Cobalt **nitrate** 13472-45-2 27774-13-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactants; for manufacture of transition-metal substituted tungstoaluminate complexes for delignification and waste mineralization)

IT **221275-85-0P** **221275-87-2P**
RL: **CAT (Catalyst use)**; IMF (Industrial manufacture); PREP (Preparation); USES (Uses)
(delignification catalysts; manufacture of transition-metal substituted tungstoaluminate complexes for delignification and waste mineralization)

RN 221275-85-0 HCAPLUS

CN Vanadate(7-), aluminate(eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxotetra-μ4-oxooxo-, heptapotassium (9CI) (CA INDEX NAME)

PAGE 1-A



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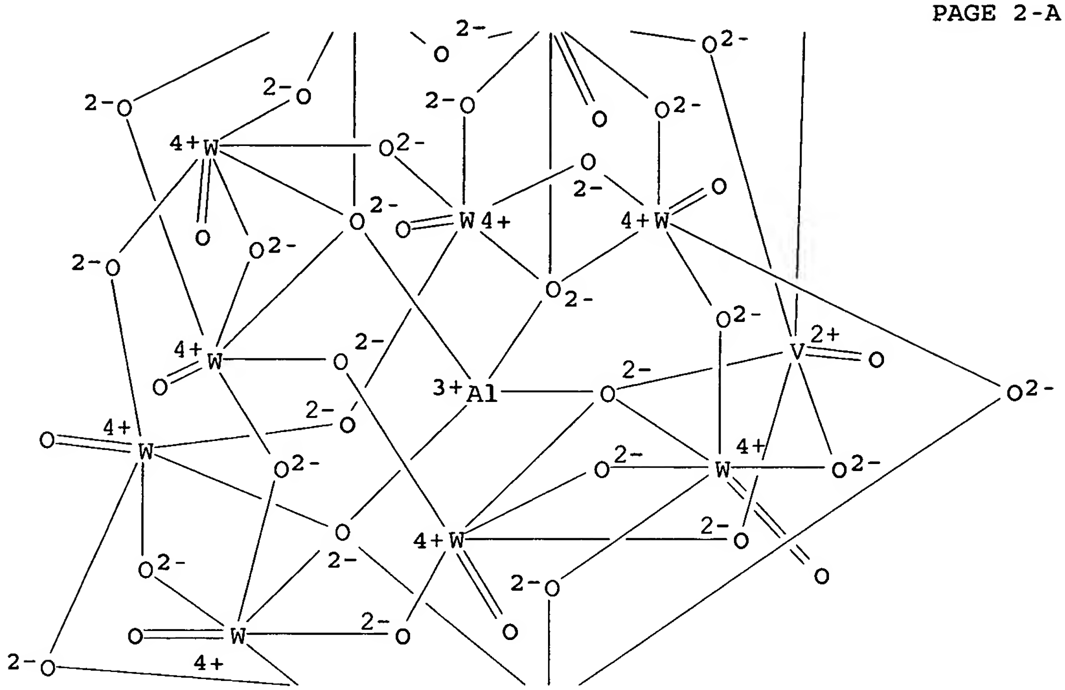

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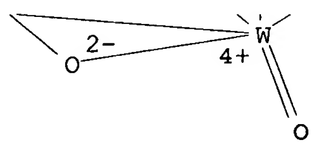
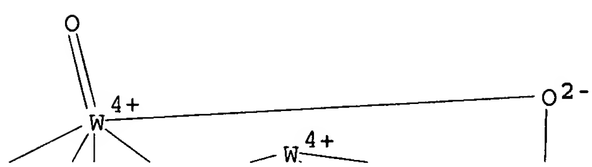


●7 K^{+}

RN 221275-87-2 HCAPLUS
CN Vanadate(6-), aluminate(eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxotetra-μ4-oxooxo-, hexapotassium (9CI) (CA INDEX NAME)

PAGE 1-A



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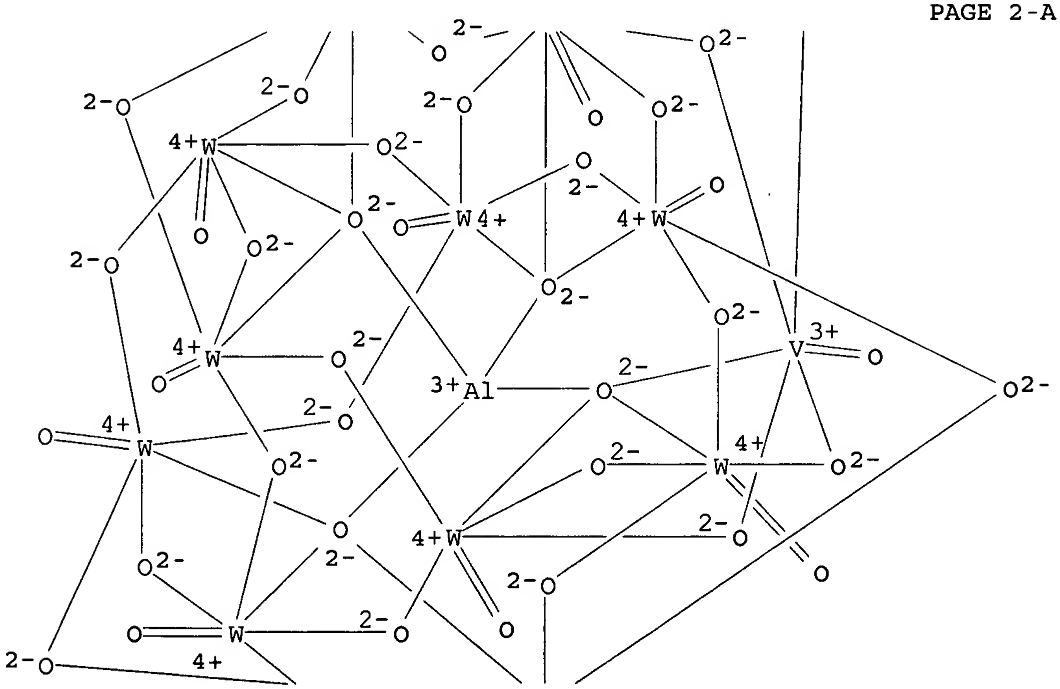

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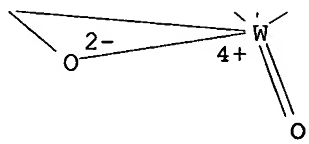
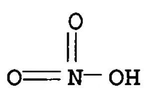


●6 K+

IT 10141-05-6, Cobalt **nitrate**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reactants; for manufacture of transition-metal substituted tungstoaluminate complexes for delignification and waste mineralization)
RN 10141-05-6 HCAPLUS
CN Nitric acid, cobalt(2+) salt (8CI, 9CI) (CA INDEX NAME)



●1/2 Co(II)

RE.CNT 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 17 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1999:142393 HCAPLUS
DN 130:239099
TI Manufacture of carboxyl-containing polysaccharides by oxidation
IN Shinpo, Masafumi; Tomita, Kazuyuki
PA Mitsubishi Gas Chemical Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

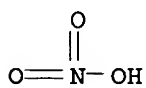
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11060602	A2	19990302	JP 1997-226409	19970822 <--
PRAI	JP 1997-226409		19970822		

AB The CO2H-containing polysaccharides, useful as scale inhibitors, pigment dispersants, sizing agents, admixts. of concretes, and builders for cleaning compns., are manufactured by oxidation of polysaccharides with NO2/N2O4 in the presence of transition metal catalysts. Thus, 3.60 g corn starch (pyranose unit 19.4 mmol) was oxidized with 4.48 g liquid NO2/N2O4 (97 mmol as NO2) at 70° and 3.2 MPa for 6 h in the presence of 63 mg crushed V2O5 in 80 mL CCl4 to give an oxidized product with Mw 3700 and CO2H content 8.0 mequiv/g, in which approx. 100% 6-CH2OH was oxidized to CO2H and 24% 2- and 3-OH was cleaved to become polycarboxylic acids.
IC ICM C08B031-18
CC 44-6 (Industrial Carbohydrates)
IT 1314-62-1, Vanadium oxide (V2O5), uses 7803-55-6, Ammonium vanadate

(NH4VO3) **10421-48-4**, Ferric **nitrate** 12026-57-2,
Phosphomolybdic acid (H3PMo12O40) **12293-15-1 12293-21-9**
15520-84-0, Cobalt **nitrate** [Co(NO3)3]
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation catalyst; manufacture of carboxyl-containing polysaccharides by oxidation)

IT **10421-48-4**, Ferric **nitrate 12293-15-1**
12293-21-9
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation catalyst; manufacture of carboxyl-containing polysaccharides by oxidation)

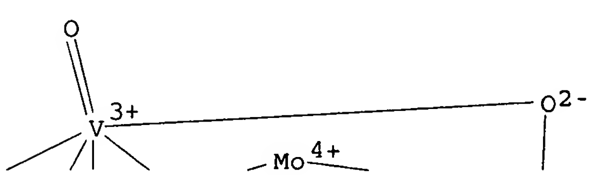
RN 10421-48-4 HCAPLUS
CN Nitric acid, iron(3+) salt (8CI, 9CI) (CA INDEX NAME)



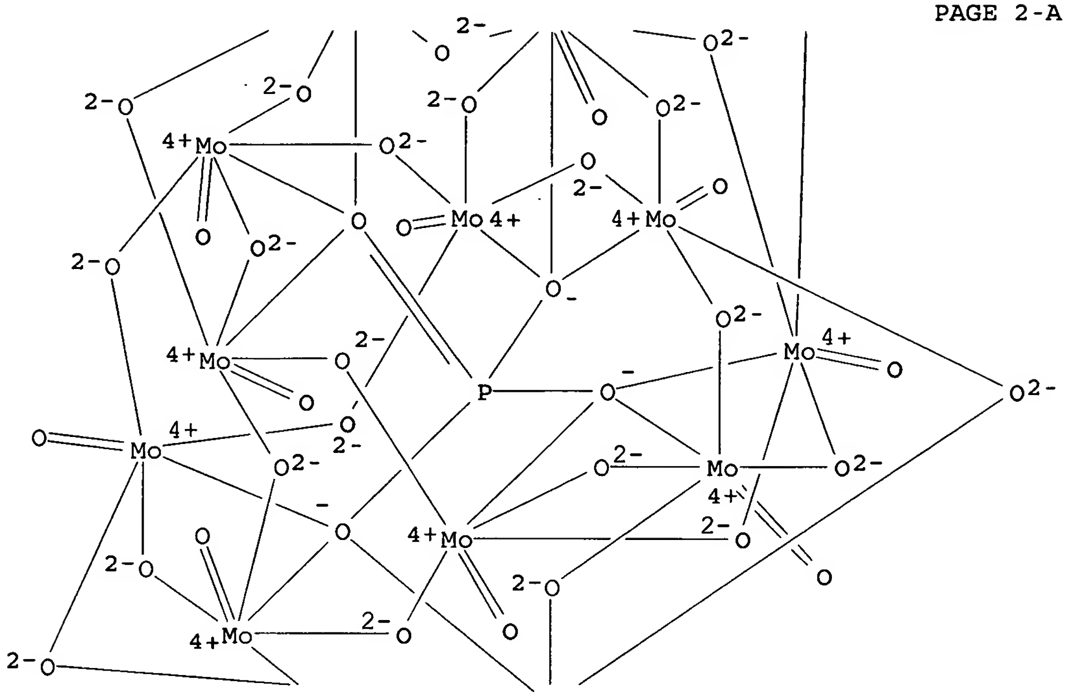
●1/3 Fe(III)

RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

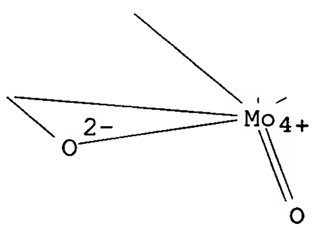
PAGE 1-A



PAGE 2-A



PAGE 3-A

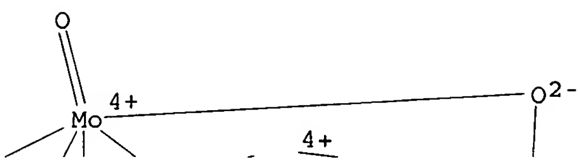


● 4 H^+

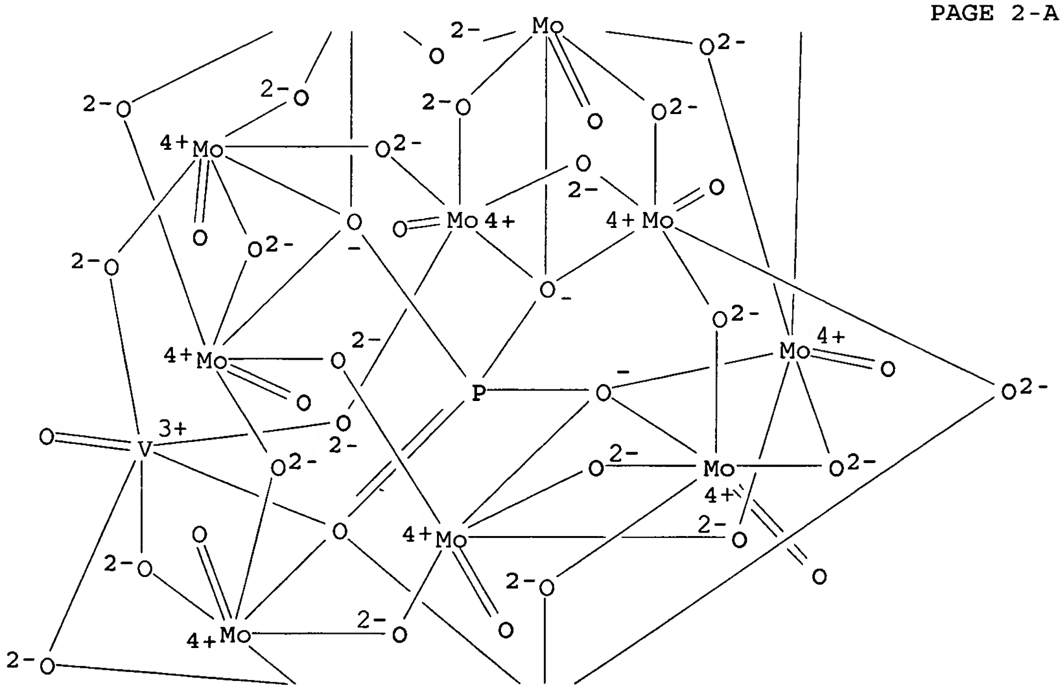
RN 12293-21-9 HCAPLUS

CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

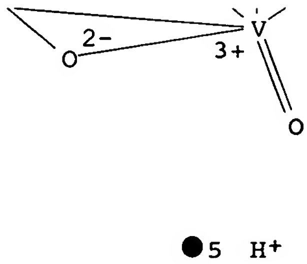
PAGE 1-A



PAGE 2-A



PAGE 3-A



L35 ANSWER 18 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1997:753705 HCAPLUS
DN 128:80374
TI Functional action of Keggin-type mono-vanadium(V)-substituted **heteropolymolybdate** as a single species on catalytic hydroxylation of benzene in the presence of hydrogen peroxide
AU Nomiya, Kenji; Yagishita, Kazunori; Nemoto, Yukihiro; Kamataki, Tada-aki
CS Hiratsuka, Department of Materials Science, Kanagawa University, Kanagawa 259-12, Japan
SO Journal of Molecular Catalysis A: Chemical (**1997**), 126(1), 43-53
CODEN: JMCCF2; ISSN: 1381-1169
PB Elsevier Science B.V.
DT Journal
LA English
AB Benzene hydroxylation in the presence of hydrogen peroxide was studied using tetrabutylammonium salts of three types of mono-vanadium-substituted **heteropolyanions** (HPA) as catalyst precursors. [PMo11VO40]4- (PMo11V, 1), which was first prepared herein and identified as a single species. [PMo11VO40]4- (PMo11V', 4), which was obtained traditionally by the so-called ether-extraction method and known as a mixed species only with an averaged **composition** P:Mo:V = 1:11:1. [PW11VO40]4- (PW11V, 2), which has been prepared as a single species. 1 Catalytically oxidized benzene to phenol under the conditions: 0.1 mmol catalyst, 10 mL (113 mmol) benzene, 5 or 10 mL of CH3CN and 2 mL of 30 aqueous H2O2. The catalytic turnover by 1 for phenol production was dependent on the amount of CH3CN: it was 1.3 after 120 h reaction with 10 mL CH3CN and 1.7 after 192 h reaction with 5 mL CH3CN. On the other hand, 2 did not show catalytic activity even after 240 h reaction under the same conditions. In comparison, it was also confirmed there was no catalytic effect by [PMo12O40]3- (PMo12) without a vanadium(V) center. 4 Has apparently shown a more enhanced effect, e.g. with catalytic turnover of 7.5 after 144 h reaction with 10 mL CH3CN. These observations significantly suggest that the catalysis by PMo11V for benzene hydroxylation is due to cooperative action of the molybdenum framework with one vanadium(V) center. Such action of the polyoxoanion framework has not been observed in the selectively site-substituted vanadium(V) **heteropolytungstates** such as [α-1,2-PW10V2O40]5- and [α-1,2,3-PW9V3O40]6-, the catalyzes by which were due to the dinuclear vanadium centers with corner-shared octahedra. Furthermore, the marked stability of the mono-vanadium(V)-substituted species 1 of several vanadium(V)-substituted **heteropolymolybdates** as catalyst precursors was clarified in the benzene hydroxylation.
CC 67-1 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 25, 45, 78
IT **Heteropoly** acids
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)
(molybdovanadophosphates; preparation of Keggin-type molybdovanadophosphates

as hydroxylation catalyst for benzene)

IT 12026-57-2P **59519-72-1P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(for preparation of Keggin-type molybdovanadophosphates as hydroxylation catalyst for benzene)

IT **12293-15-1P** 53749-36-3P **62036-80-0P** 152469-21-1P **200558-44-7P** 200558-46-9P
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of Keggin-type molybdovanadophosphates as hydroxylation catalyst for benzene)

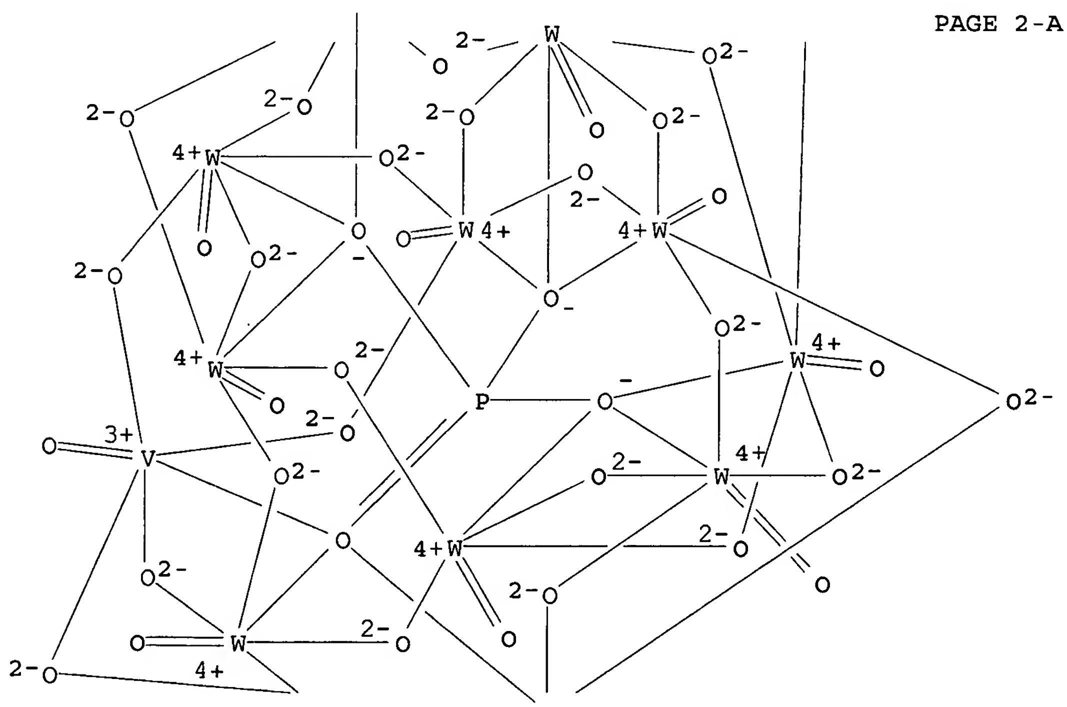
IT **59519-72-1P**
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(for preparation of Keggin-type molybdovanadophosphates as hydroxylation catalyst for benzene)

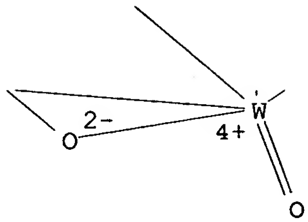
RN 59519-72-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrapotassium (9CI) (CA INDEX NAME)

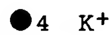
* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A





PAGE 3-A

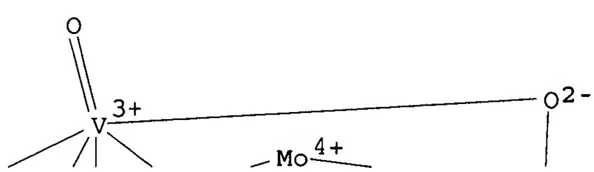


IT 12293-15-1P 62036-80-0P 200558-44-7P
RL: **CAT (Catalyst use)**; SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of Keggin-type molybdovanadophosphates as hydroxylation catalyst for benzene)

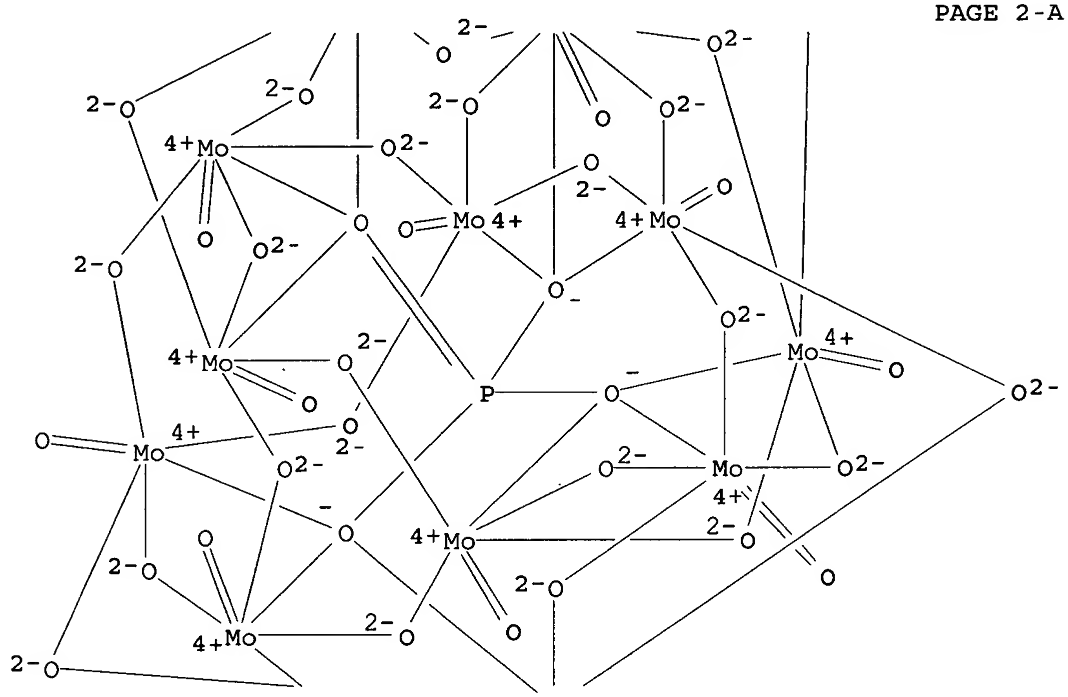
RN 12293-15-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



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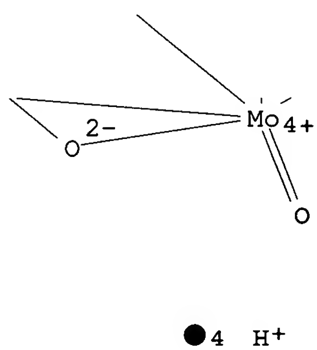


RN 62036-80-0 HCAPLUS

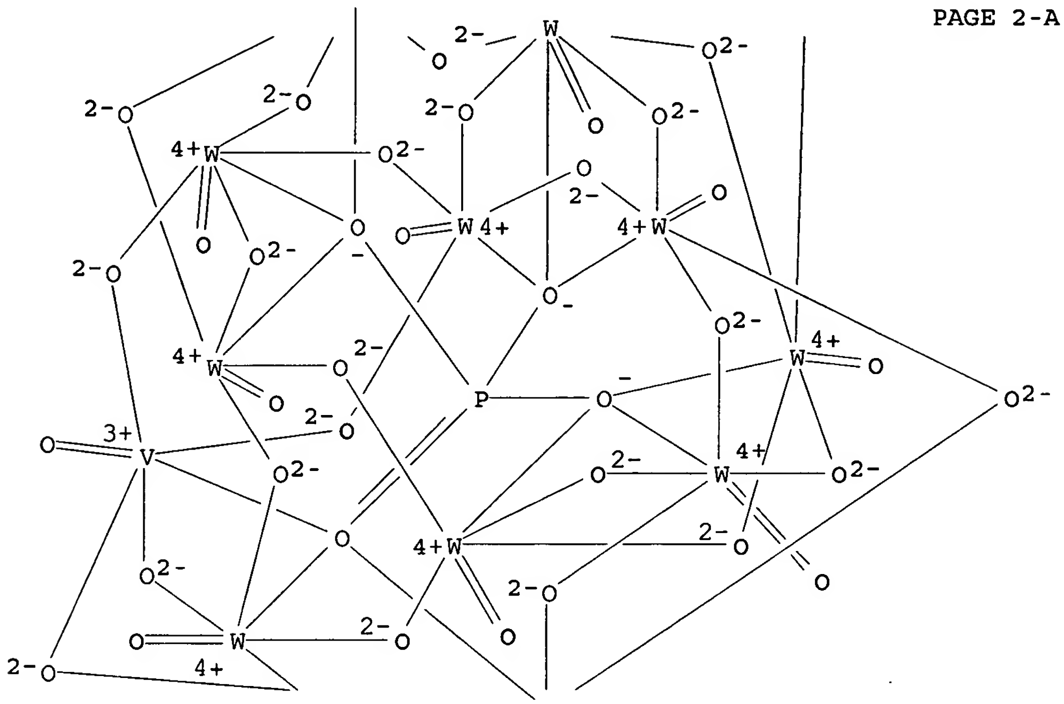
CN 1-Butanaminium, N,N,N-tributyl-, (eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]vanadate(4-) (4:1) (9CI) (CA INDEX NAME)

CM 1

CRN 56367-82-9
CMF O40 P V W11
CCI CCS

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



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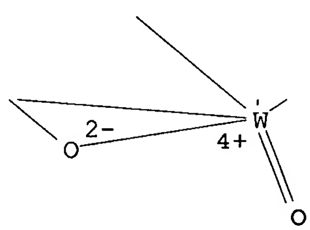
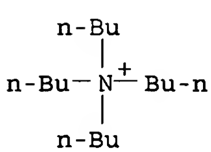


CM 2

CRN 10549-76-5
CMF C16 H36 N



RN 200558-44-7 HCAPLUS
CN 1-Butanaminium, N,N,N-tributyl-, (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-

κO:κO:κO:κO':κO':κO':κO'':.kappa
.O'':κO'':κO''':κO''':κO''']]vanadate(4-) (4:1)
(9CI) (CA INDEX NAME)

CM 1

CRN 54578-48-2
CMF Mo11 O40 P V
CCI CCS

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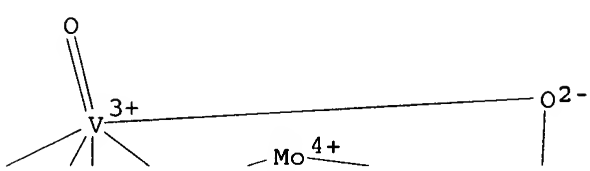

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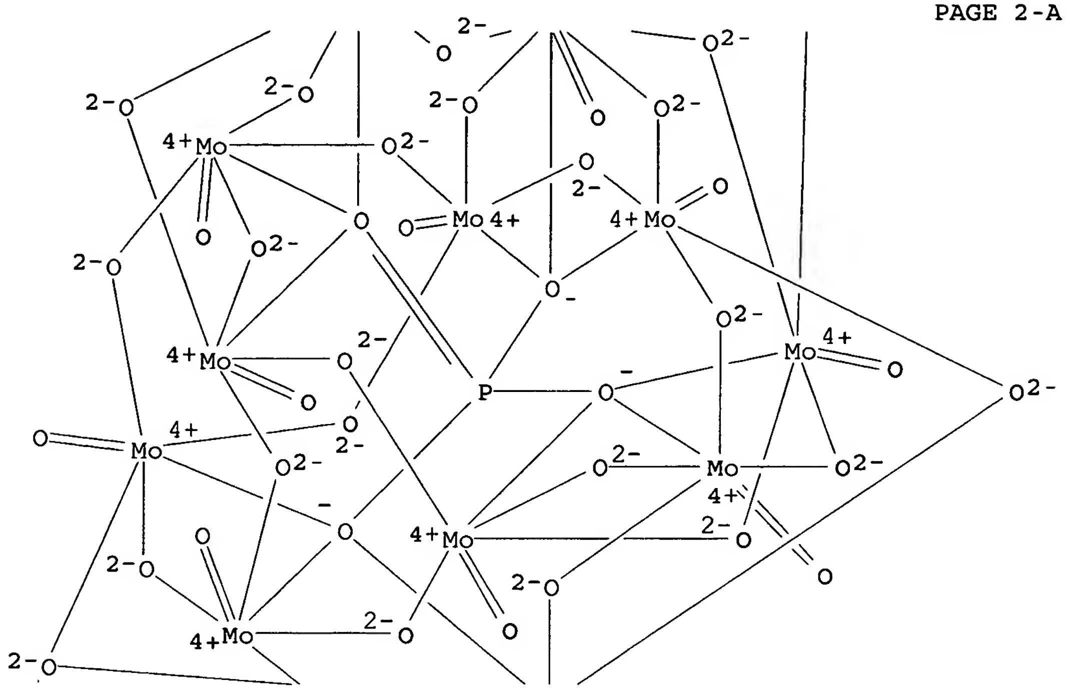

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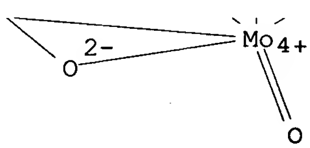
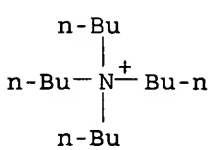


CM 2

CRN 10549-76-5
CMF C16 H36 N



RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L35 ANSWER 19 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1995:275515 HCAPLUS
DN 122:160091
TI Preparation of carbonyl compounds from olefins

IN Ishii, Hirotoshi; Saito, Yoshinori
PA Idemitsu Kosan Co, Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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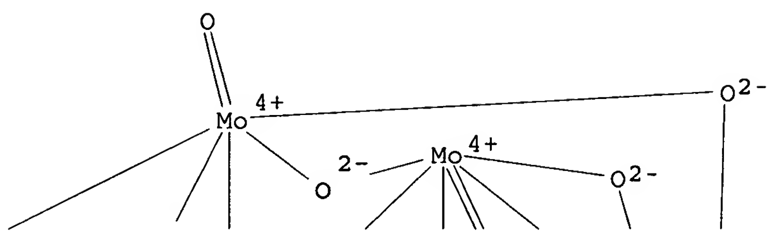
PI	JP 06279343	A2	19941004	JP 1993-68194	19930326 <--
PRAI	JP 1993-68194		19930326		

OS CASREACT 122:160091
AB Carbonyl compds. are prepared by reaction of olefins with O or O-containing gases in (H2O-containing) organic solvents in the presence of Pd (compds.), β-aryl-α,β -unstd. carbonyl compds., and redox agents.
Trans-2-butene (267 mmol) was treated with O in 1,4-dioxane-H2O in the presence of PdSO4, H6PV3Mo9O40, and dibenzylideneacetone at 80° under 8 kg/cm2 for 1 h to give 109 mmol MeCOEt.
IC ICM C07C045-34
ICS B01J031-34; C07C049-04
ICA C07B061-00
CC 23-15 (Aliphatic Compounds)
Section cross-reference(s): 45
IT 103-36-6, Cinnamic acid ethyl ester 122-57-6 538-58-9, Dibenzylideneacetone 7440-05-3, Palladium, uses 10102-05-3, Palladium **nitrate 12293-24-2** 12411-60-8 13566-03-5, Palladium sulfate 52522-40-4
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of carbonyl compds. by oxidation of olefins by O with Pd-carbonyl compound-redox agent catalysts in organic solvents (and H2O))
IT **12293-24-2**
RL: **CAT (Catalyst use)**; USES (Uses)
(preparation of carbonyl compds. by oxidation of olefins by O with Pd-carbonyl compound-redox agent catalysts in organic solvents (and H2O))
RN 12293-24-2 HCAPLUS
CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa .O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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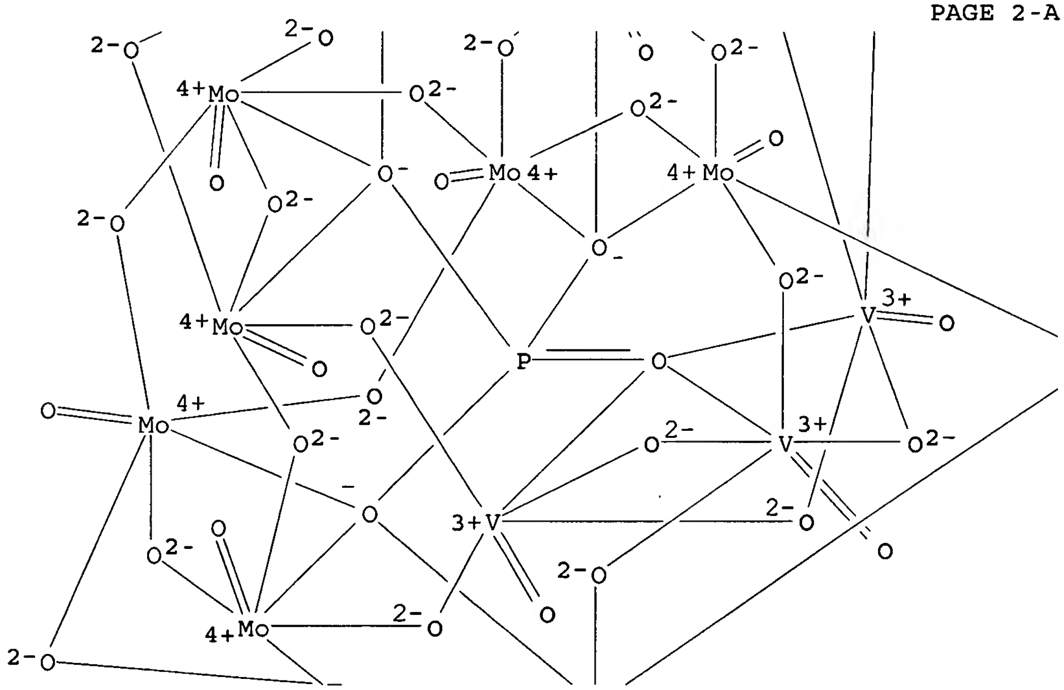

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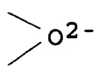

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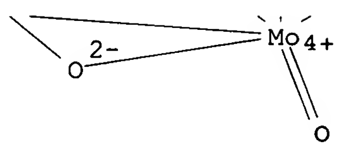
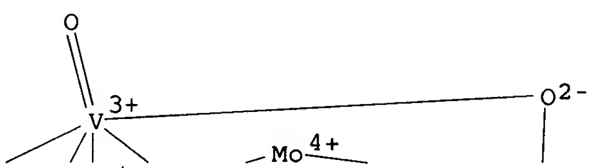


●6 H^{+}

L35 ANSWER 20 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1994:324237 HCAPLUS
DN 120:324237
TI Oxidative dehydrogenation of isobutyric acid on H4PVMo11O40, NaxH4-xPVMo11O40 and CuyH4-2yPVMo11O40 **heteropolyacid** catalysts supported on silica
AU Aboukaies, Antoine; Ghoussoub, Denise; Blouet-Crusson, Emilie; Rigole, Monique; Guelton, Michel
CS Laboratoire de Catalyse Heterogene et Homogene, URA CNRS 402, Universite des Sciences et Technologies de Lille, 59655, Villeneuve d'Ascq, Fr.
SO Applied Catalysis, A: General (**1994**), 111(2), 109-18
CODEN: ACAGE4; ISSN: 0926-860X
DT Journal
LA English
AB The oxidative dehydrogenation of isobutyric acid to methacrylic acid (I) was studied over the **heteropolyacid** H4PVMo11O40 and the acidic salts NaxH4-xPVMo11O40 and CuyH4-2yPVMo11O40, supported on silica, as catalysts. The presence of Cu as counter-cations in the **heteropoly** compds. increases the activity and the selectivity to I. This increase is probably due to the simultaneous presence in the solids of Broensted acidity and oxygen vacancies with an adequate ratio. These latter sites can more easily be obtained in the presence of Cu2+ and V4+ than with Na+ counter-ions in the catalysts.
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67
ST isobutyric acid dehydrogenation **heteropolyacid** catalyst; methacrylic acid isobutyric acid dehydrogenation; vanadium molybdenum phosphoric acid catalyst; silica support **heteropolyacid**

dehydrogenation catalyst
IT Dehydrogenation
(of isobutyric acid to methacrylic acid, in presence of silica-supported **heteropolyacid** salts)
IT Dehydrogenation catalysts
(silica-supported **heteropolyacids**, activity of, in dehydrogenation of isobutyric acid to methacrylic acid, effect of copper and vanadium counter-cations on)
IT **Heteropoly** acids
RL: CAT (Catalyst use); USES (Uses)
(molybdovanadophosphoric, catalysts, oxidative dehydrogenation of isobutyric acid in presence of, effect of copper and vanadium counter-cations on activity and selectivity in)
IT **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, silica-supported, dehydrogenation of isobutyric acid to methacrylic acid in presence of, effect of copper and vanadium counter-cations on)
IT 79-31-2, Isobutyric acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(dehydrogenation of, to methacrylic acid, activity of silica-supported **heteropolyacid** catalysts for, effect of copper and vanadium counter-cations on)
IT 1333-74-0
RL: USES (Uses)
(dehydrogenation, of isobutyric acid to methacrylic acid, in presence of silica-supported **heteropolyacid** salts)
IT 67-64-1P, Acetone, preparation 115-07-1P, Propene, preparation 124-38-9P, Carbon dioxide, preparation 630-08-0P, Carbon monoxide, preparation
RL: FORM (Formation, nonpreparative); PREP (Preparation)
(formation of, in dehydrogenation of isobutyric acid to methacrylic acid, **heteropolyacid** catalyst **composition** in relation to)
IT 7631-86-9, Silica, uses
RL: USES (Uses)
(**heteropolyacid** catalysts supported by, dehydrogenation of isobutyric acid to methacrylic acid in presence of, effect of copper and vanadium counter-cations on)
IT 79-41-4P, Methacrylic acid, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, by dehydrogenation of isobutyric acid, activity of silica-supported **heteropolyacid** catalysts for, effect of copper and vanadium counter-cations on)
IT **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, silica-supported, dehydrogenation of isobutyric acid to methacrylic acid in presence of, effect of copper and vanadium counter-cations on)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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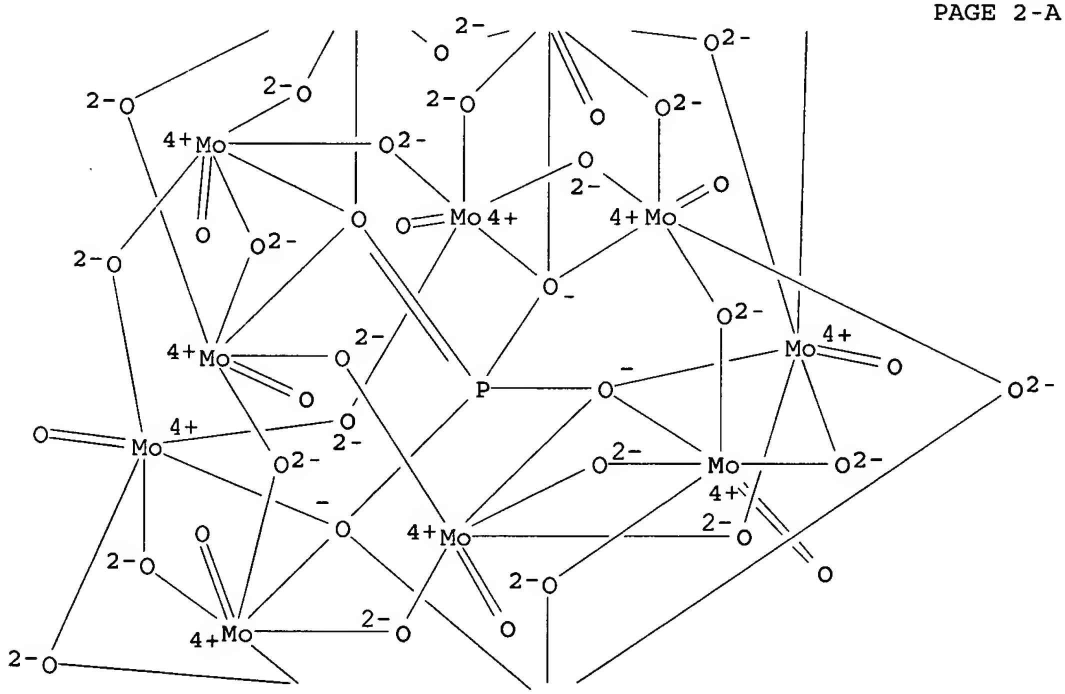

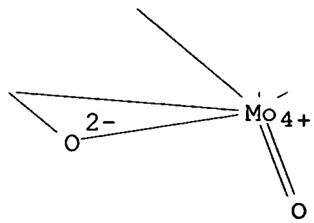

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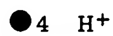
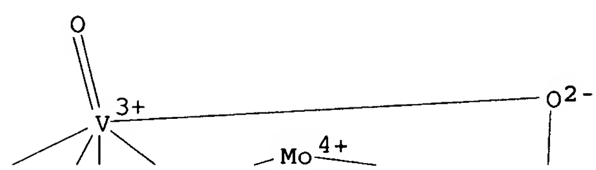


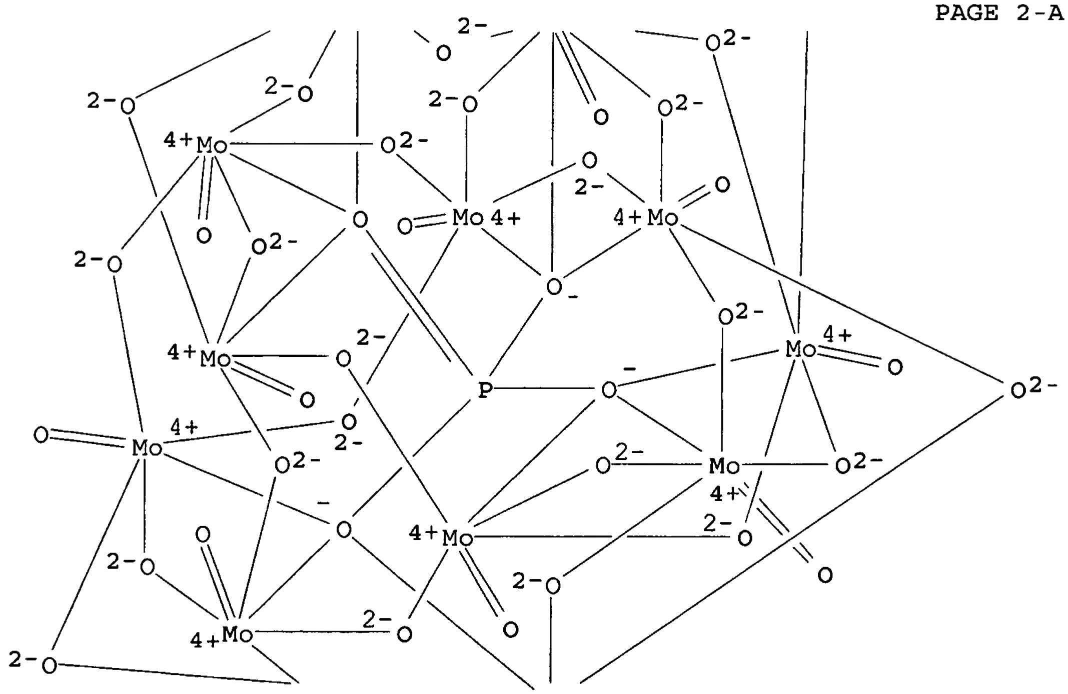
L35 ANSWER 21 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1993:148082 HCAPLUS
DN 118:148082
TI Studies on catalysts of preparing methylacrylic acid from isobutyraldehyde with one-stage oxidation
AU Chi, Hongpan; Zhang, Xianjun; Sun, Jinghui; Cui, Yinghua; Zou, Jianping; Wu, Tonghao; Yang, Hongmao; Wang, Guojia; Zhang, Hengbin; et al.
CS Res. Inst., Qilu Petrochem. Co., Peop. Rep. China
SO Proc. Int. Conf. Pet. Refin. Petrochem. Process. (**1991**), Volume 3, 1367-72. Editor(s): Hou, Xianglin. Publisher: Int. Acad. Publ., Beijing, Peop. Rep. China.
CODEN: 58CEA7
DT Conference
LA English
AB **Heteropolyacids** with formula P1.33-mAsmMo12VaSbbCucKdOx are used to prepare methacrylic acid from isobutyraldehyde. The selectivity of the reaction is determined as a function of the catalyst **composition**
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 67
ST methacrylic acid prepn oxidn isobutyraldehyde; catalyst **heteropolyacid** oxidn isobutyraldehyde
IT Oxidation catalysts
(**heteropolyacids**, for conversion of isobutyraldehyde to methacrylic acid)
IT 12026-57-2 **12293-15-1** 146750-43-8
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation catalysts, for conversion of isobutyraldehyde to methacrylic acid)
IT 78-84-2, Isobutyraldehyde
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, to methacrylic acid, **heteropolyacid** catalysts for)
IT 79-41-4P, preparation
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, by oxidation of isobutyraldehyde, **heteropolyacid** catalysts for)
IT **12293-15-1**
RL: **CAT (Catalyst use)**; USES (Uses)
(oxidation catalysts, for conversion of isobutyraldehyde to methacrylic acid)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kapp

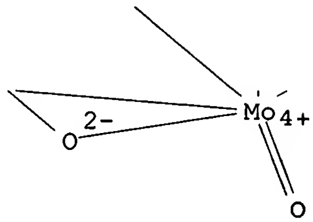
a.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A

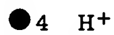


PAGE 2-A





PAGE 3-A



L35 ANSWER 22 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1990:197563 HCAPLUS
DN 112:197563
TI **Heteropolyacids** as catalysts for synthesis of methyl tert-butyl ether
AU Maksimov, G. M.; Kozhevnikov, I. V.
CS Inst. Catal., Novosibirsk, 630090, USSR
SO Reaction Kinetics and Catalysis Letters (**1989**), 39(2), 317-22
CODEN: RKCLAU; ISSN: 0304-4122
DT Journal
LA English
AB The influence of the **composition** and structure of **heteropolyacids** (HPA) on their catalytic activity in the liquid phase synthesis of Me tert-Bu ether (MTBE) at 42° has been studied. The activity of HPA is compared with that of other acid catalysts. The most active are HPA's of the Dawson structure, followed by HPA's of the Keggin and Dexter-Silverton structures. HPA salts have low activity in the synthesis of MTBE.
CC 23-9 (Aliphatic Compounds)
Section cross-reference(s): 67
ST methyl butyl ether; etherification catalyst **heteropolyacid**
IT **Heteropoly** acids
RL: CAT (Catalyst use); USES (Uses)
(catalysts, for etherification of methanol with isobutylene)
IT Etherification catalysts
(**heteropolyacids**, for methanol with isobutylene)
IT 1343-93-7 7664-93-9, Sulfuric acid, uses and miscellaneous **11074-20-7** 11098-94-5, KU-2 12026-57-2 12026-93-6 12027-03-1 12027-38-2 12050-53-2 12207-90-8 **12293-15-1** **12398-74-2** 12411-74-4 77839-56-6 77839-56-6D, reduced 78897-19-5 78897-19-5D, reduced 112219-35-9 112219-35-9D, reduced 123047-98-3 125540-23-0 125540-23-0D, reduced 125540-24-1 125540-24-1D, reduced 126871-94-1D, reduced
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for etherification of methanol by isobutylene)
IT 115-11-7, Isobutylene, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(etherification by, of methanol, **heteropolyacid** catalysts for)
IT 67-56-1, Methanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(etherification of, by isobutylene, **heteropolyacid** catalysts

for)

IT 1634-04-4P, tert-Butyl methyl ether
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, by **heteropolyacid**-catalyzed etherification of methanol by isobutylene)

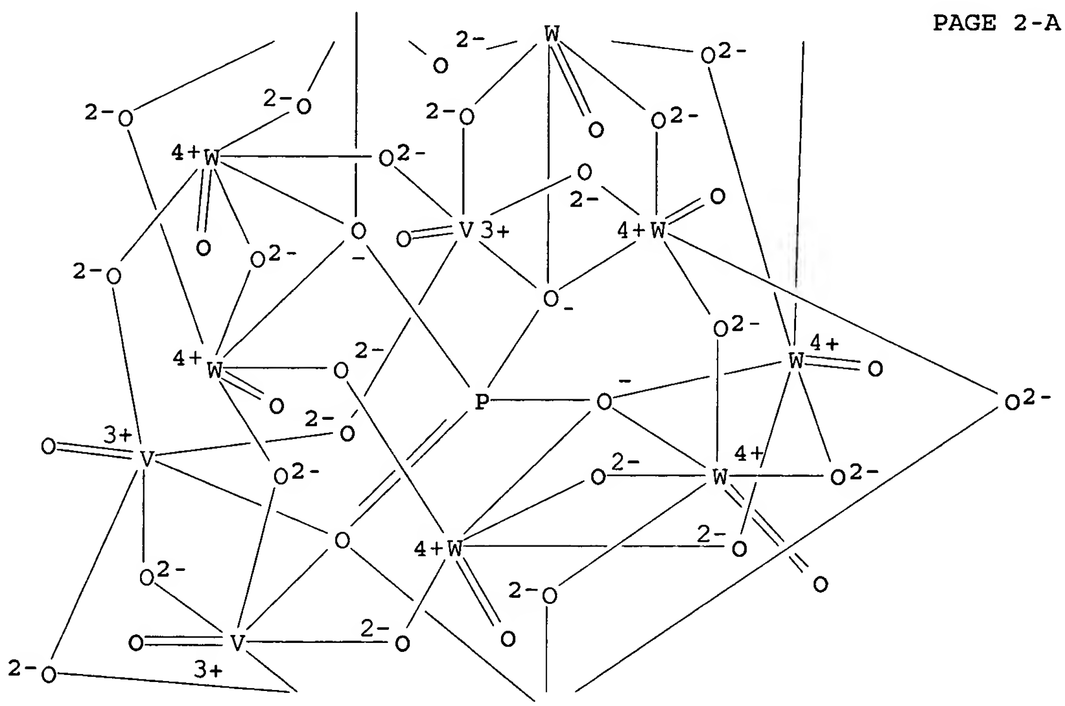
IT **11074-20-7 12293-15-1 12398-74-2**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalyst, for etherification of methanol by isobutylene)

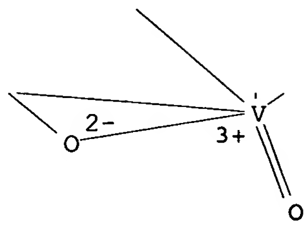
RN 11074-20-7 HCAPLUS

CN Vanadate(7-), (dodeca-μ-oxooctaoxooctatungstate)dodeca-μ-oxotetraoxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.ka ppa.O':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-, heptahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A





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RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

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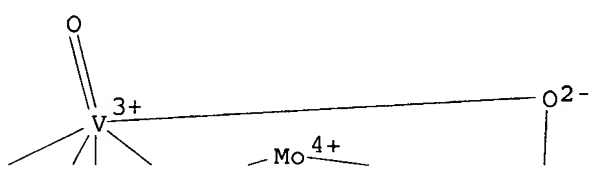

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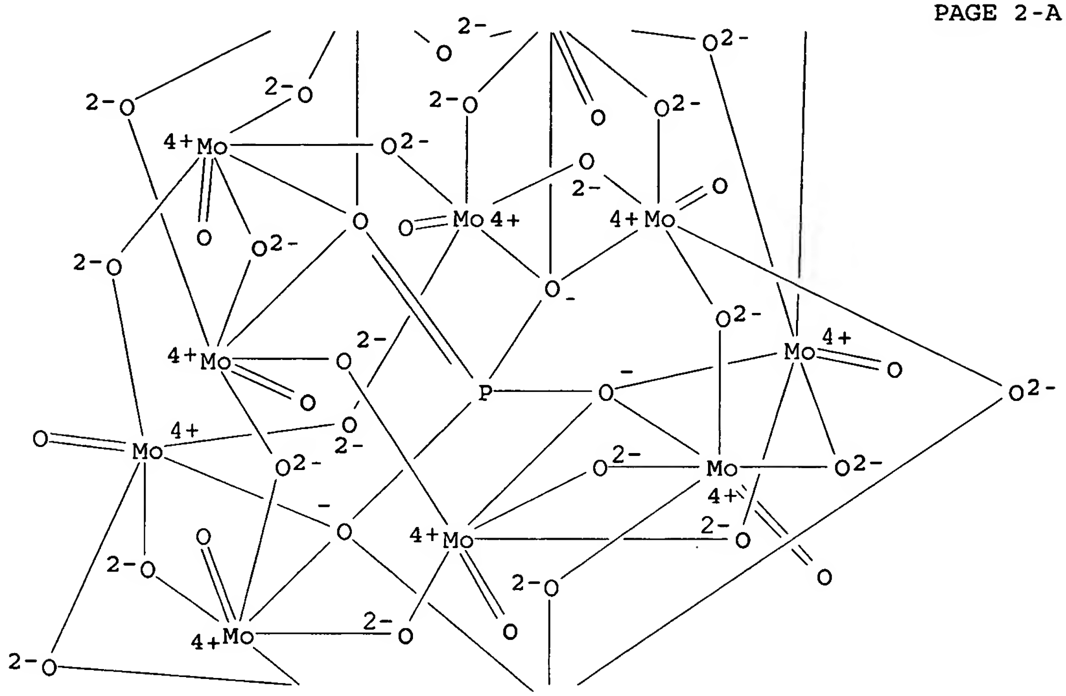

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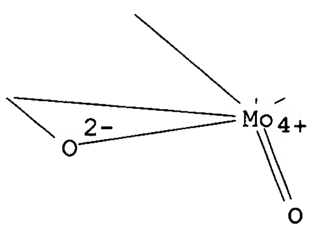
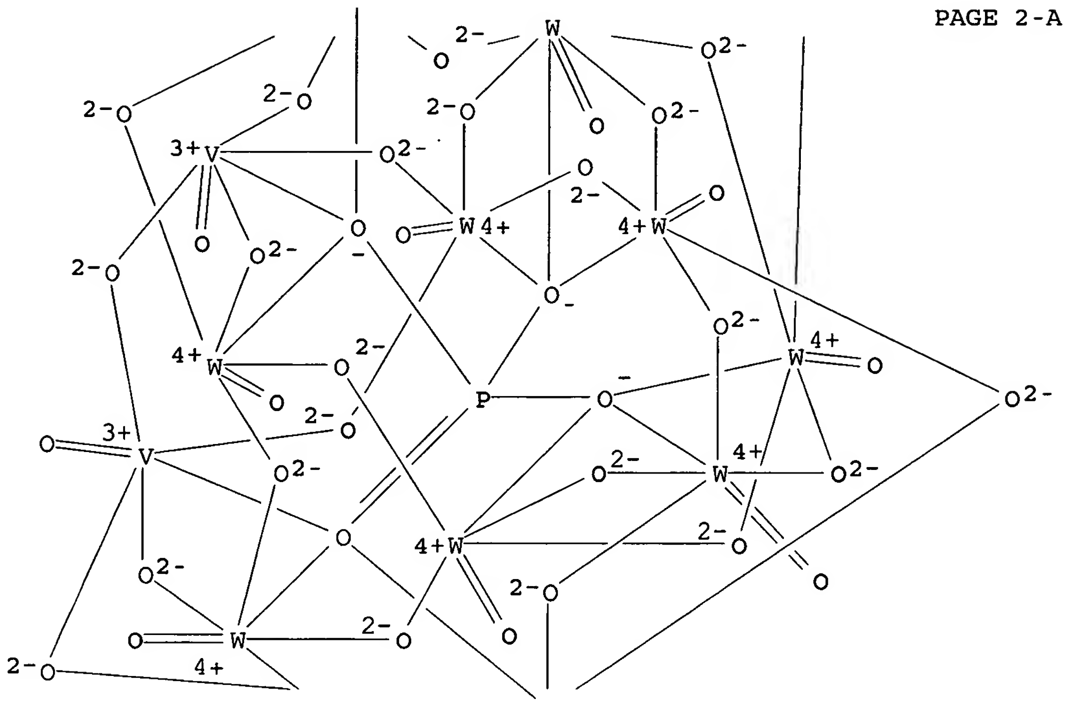


● 4 H^+

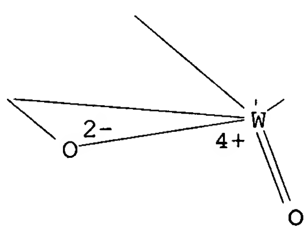
RN 12398-74-2 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecatungstate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



PAGE 3-A



● 5 H^+

L35 ANSWER 23 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1989:407802 HCAPLUS
DN 111:7802
TI Kinetic investigation of methacrylic acid synthesis on **heteropoly** compounds
AU Haeberle, Thomas; Emig, Gerhard
CS Roehm G.m.b.H. Chem. Fabr., Darmstadt, D-6100/1, Fed. Rep. Ger.
SO Chemical Engineering & Technology (**1988**), 11(6), 392-402
CODEN: CETEER; ISSN: 0930-7516
DT Journal
LA English
AB The kinetics of oxydehydrogenation of isobutyric acid to methacrylic acid (I) catalyzed by H5PV2Mo10O40 and its Cs salts was studied, and a model describing the formation of I as well as the formation of acetone and

propene by redox side reactions was developed. A relationship was found between the model parameters and catalyst **composition** Catalyst deactivation was caused mainly by the loss of Mo with simultaneous collapse of the Keggin structure.

CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 23

ST isobutyric acid oxydehydrogenation kinetics modeling; methacrylic acid prepn kinetics modeling; molybdovanadophosphate catalyst isobutyric acid oxydehydrogenation; **heteropoly** acid catalyst oxydehydrogenation

IT **Heteropoly** acids
RL: CAT (Catalyst use); USES (Uses)
(molybdovanadophosphates, catalysts, for oxydehydrogenation of isobutyric acid to methacrylic acid, kinetic modeling in relation to)

IT **12293-15-1 12293-21-9** 90638-57-6
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for oxydehydrogenation of isobutyric acid to methacrylic acid, kinetic modeling in relation to)

IT 104712-53-0 121072-28-4 121072-29-5 **121072-30-8**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for oxydehydrogenation of isobutyric acid to methacrylic acid, selectivity of)

IT **12293-15-1 12293-21-9**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for oxydehydrogenation of isobutyric acid to methacrylic acid, kinetic modeling in relation to)

RN 12293-15-1 HCAPLUS

CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

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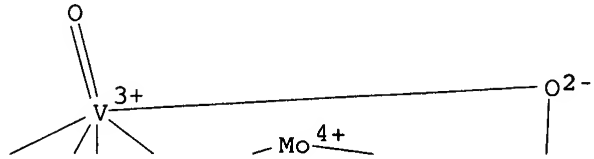

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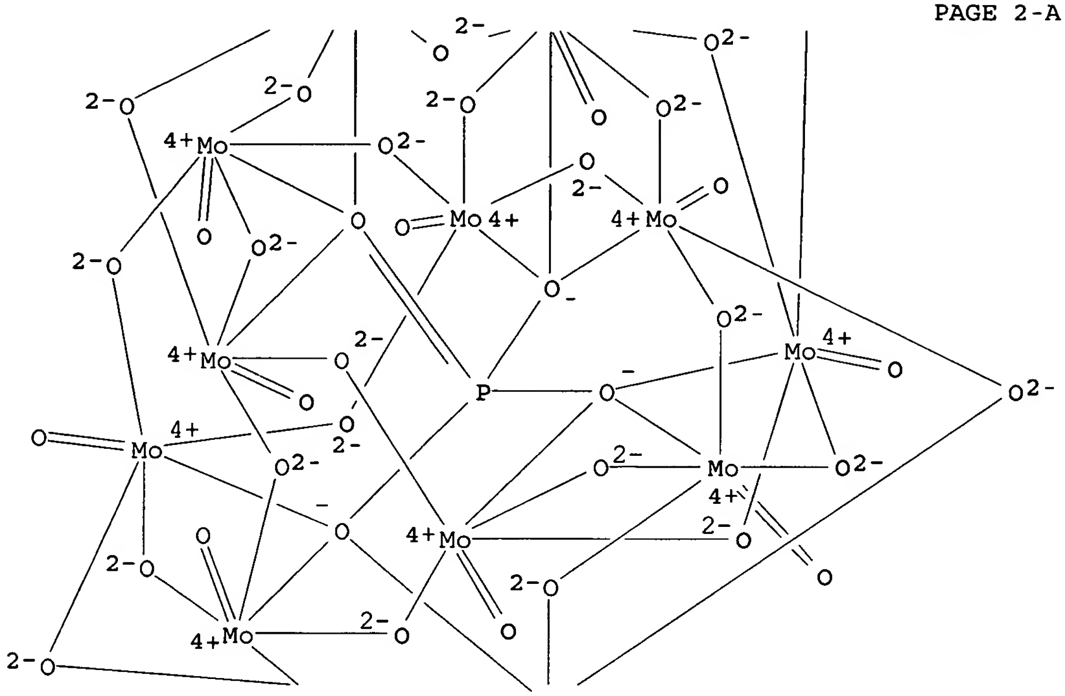

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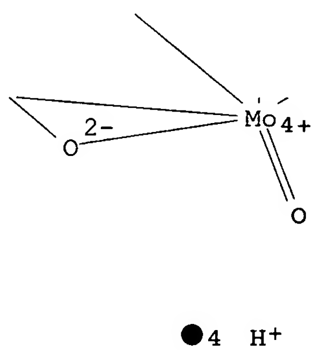
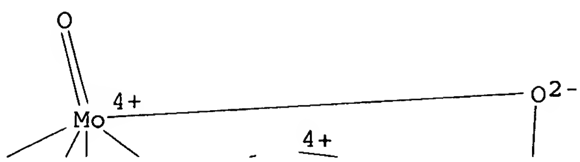
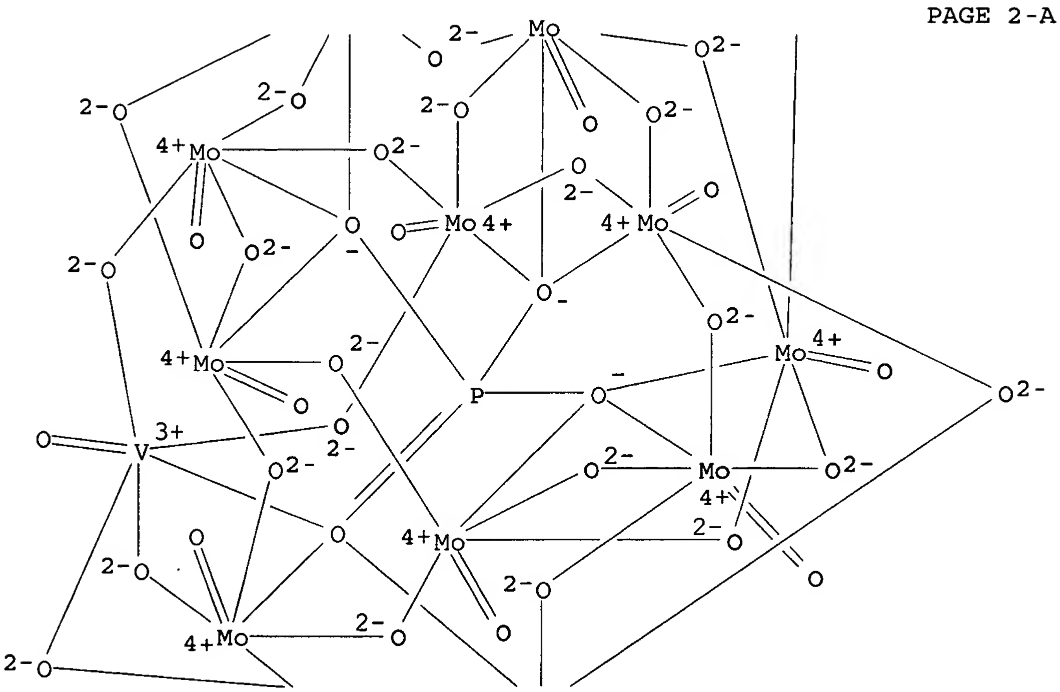


RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

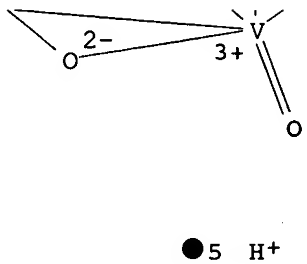
PAGE 1-A



PAGE 2-A



PAGE 3-A



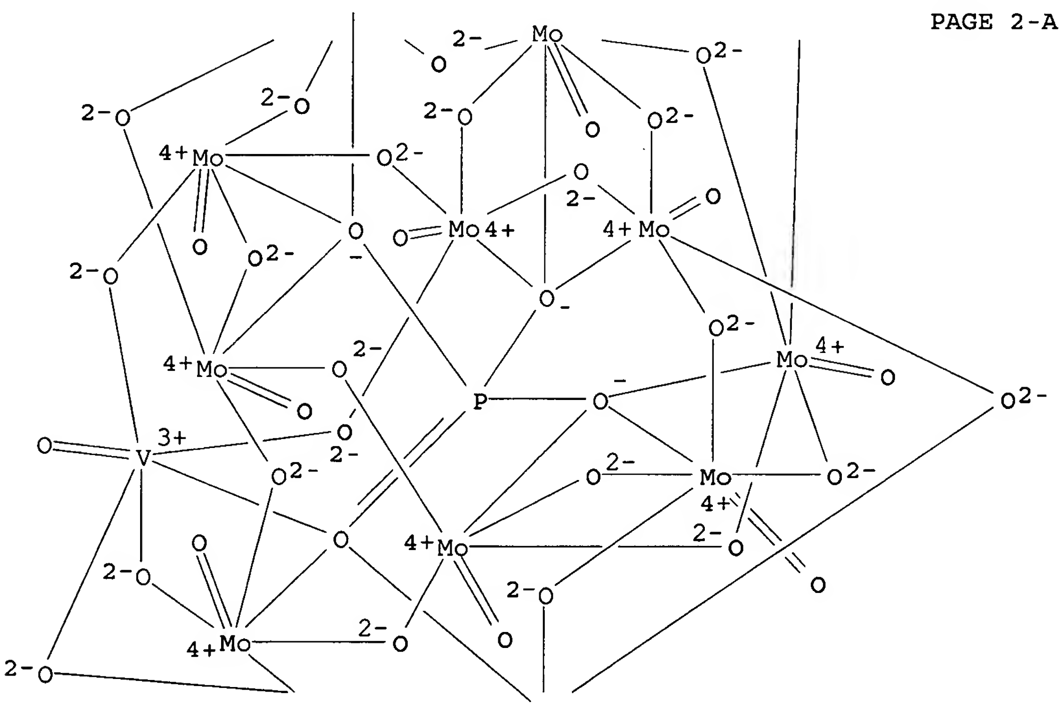
IT 121072-30-8
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for oxydehydrogenation of isobutyric acid to methacrylic acid, selectivity of)

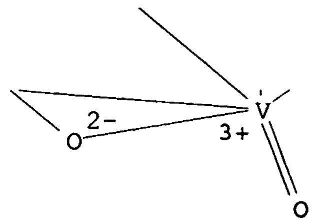
RN 121072-30-8 HCAPLUS

CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentacesium (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



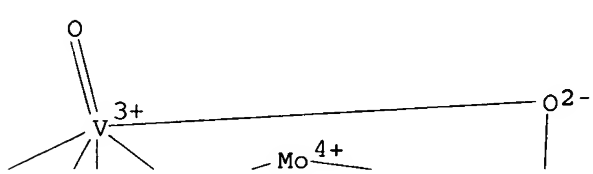


PAGE 3-A

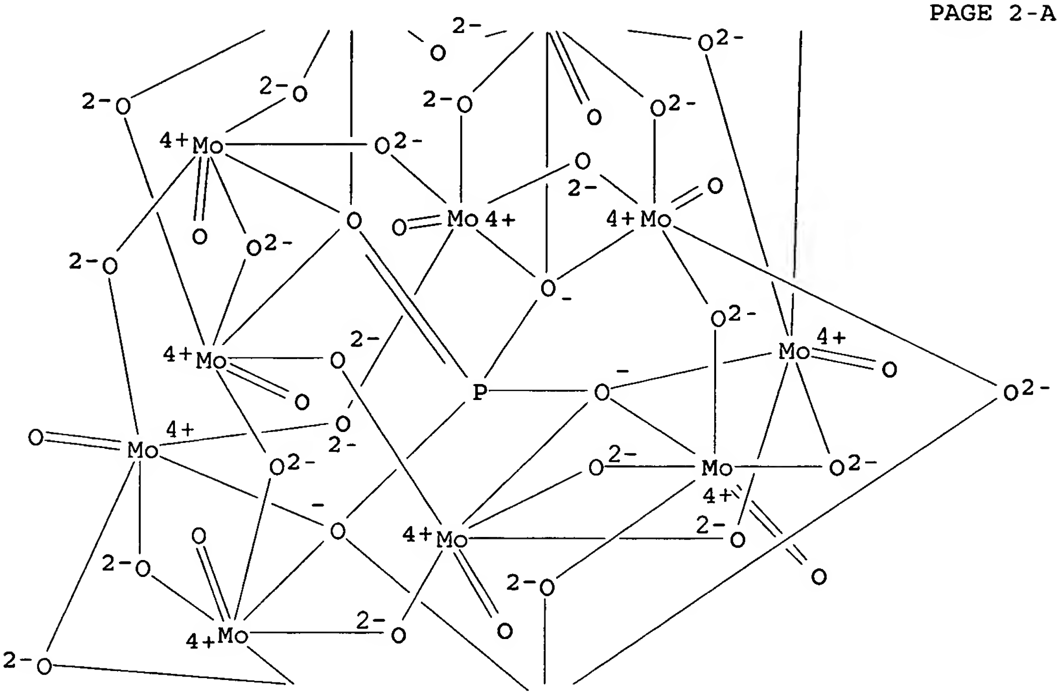
L35 ANSWER 24 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1988:439701 HCAPLUS
DN 109:39701
TI **Heteropolysalt**-supported **heteropolyacids** as a new class of acid-base and redox catalysts
AU Bruckman, K.; Haber, J.; Lalik, E.; Serwicka, E. M.
CS Inst. Catal. Surf. Chem., Pol. Acad. Sci., Krakow, 30-249, Pol.
SO Catalysis Letters (**1988**), 1(1-3), 35-40
CODEN: CALEER; ISSN: 1011-372X
DT Journal
LA English
AB **Heteropoly** acids of **composition** H3+nPVnMo12-nO40 (n = 0-3) when supported on K3PMo12O40 displayed new types of acid-base and redox properties and had enhanced thermal stability. The oxidation of acrolein to acrylic acid and the dehydration of iso-PrOH to propylene with these catalysts were examined
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 35
ST **heteropoly** acid catalyst oxidn dehydration; acrolein oxidn acrylic acid; propanol dehydration propylene; molybdophosphate redox catalyst support
IT **Heteropoly** acids
RL: CAT (Catalyst use); USES (Uses)
(catalysts, supported, for dehydration and oxidation of organic compds.)
IT Dehydration catalysts
(**heteropoly** acids, supported, for iso-Pr alc. in production of propylene)
IT Oxidation catalysts
(selective, **heteropoly** acids, supported, for acrolein in production of acrylic acid)
IT 12026-57-2 **12293-15-1 12293-21-9 12293-24-2**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, supported, for dehydration and oxidation of organic compds.)
IT 67-63-0, 2-Propanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(dehydration of, supported **heteropoly** acids as catalysts for)
IT 107-02-8, Acrolein, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, to acrylic acid, supported **heteropoly** acids as catalysts for)
IT 115-07-1P, Propene, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of, by dehydration of iso-Pr alc., supported **heteropoly** acids as catalysts for)

IT 79-10-7P, Acrylic acid, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of, by oxidation of acrolein, supported **heteropoly** acids as catalysts for)
IT 12026-68-5
RL: USES (Uses)
(supports, for **heteropoly** acid catalysts for dehydration and oxidation of organic compds.)
IT **12293-15-1 12293-21-9 12293-24-2**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, supported, for dehydration and oxidation of organic compds.)
RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

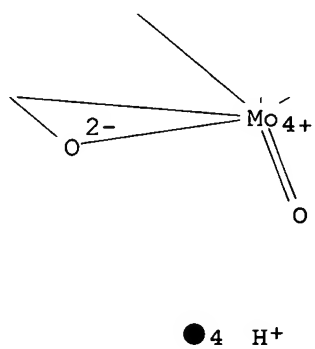
PAGE 1-A



PAGE 2-A

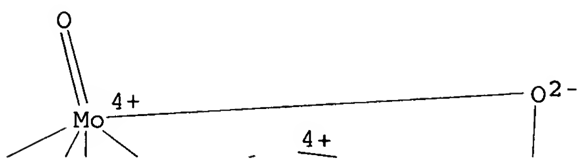


PAGE 3-A

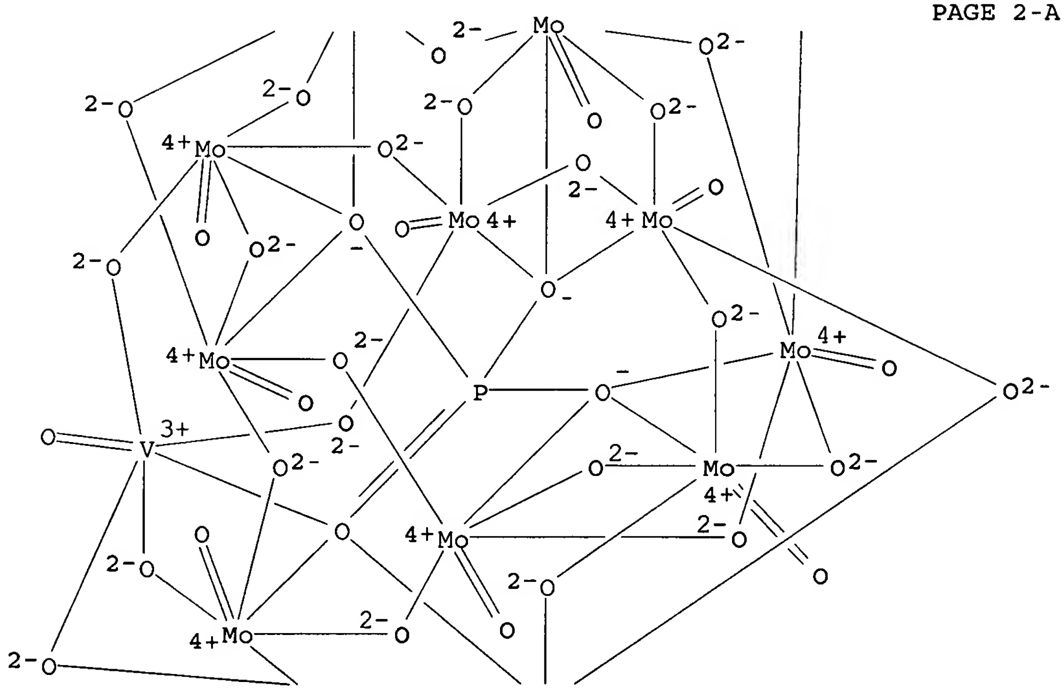


RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

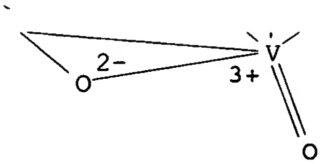
PAGE 1-A



PAGE 2-A

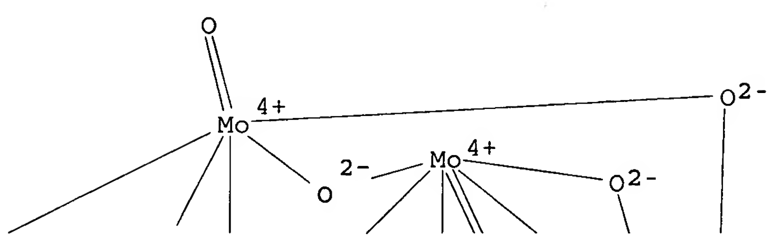


PAGE 3-A



RN 12293-24-2 HCAPLUS
CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

PAGE 1-A



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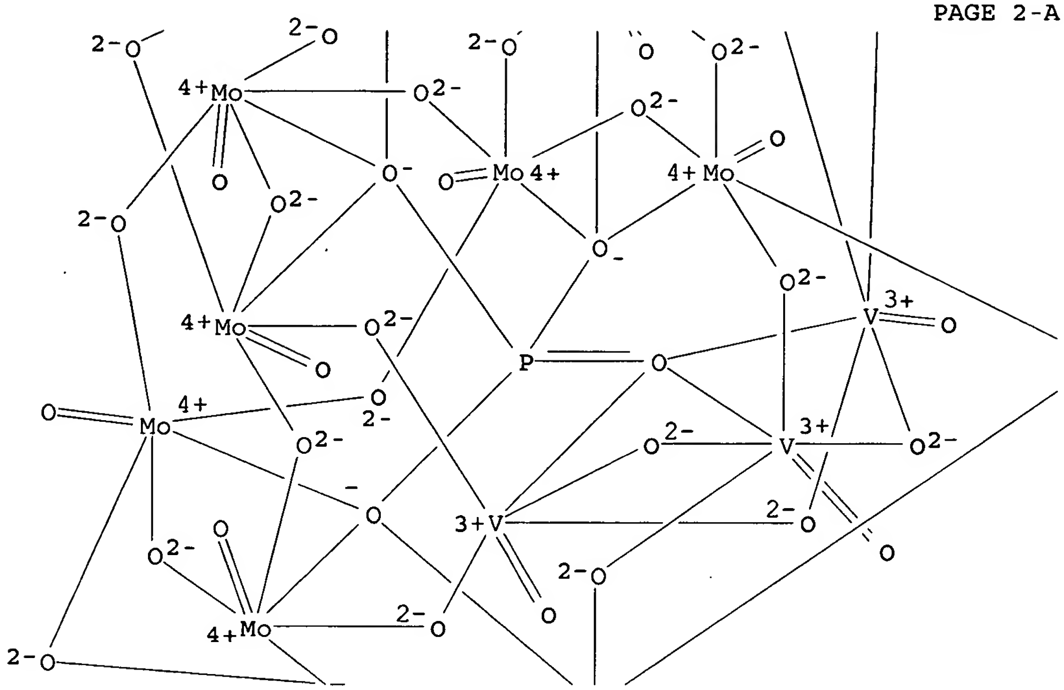
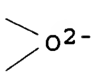
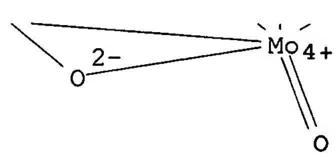


PAGE 2-B



PAGE 3-A



● 6 H^+

L35 ANSWER 25 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1987:578602 HCAPLUS
DN 107:178602
TI Olefin oxidation catalyst system
IN Vasilevskis, Janis; De Deken, Jacques C.; Saxton, Robert J.; Wentrcek, Paul R.; Fellmann, Jere D.; Kipnis, Lyubov S.
PA Catalytica Associates, USA
SO PCT Int. Appl., 96 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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	RW: AT, BE, CH, DE, FR, GB, IT, LU, NL, SE				
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	US 4723041	A	19880202	US 1986-846554	19860331 <--
	IN 168521	A	19910420	IN 1986-CA651	19860828 <--
	ZA 8606653	A	19870729	ZA 1986-6653	19860902 <--
	AU 8663752	A1	19870407	AU 1986-63752	19860918 <--
	EP 238633	A1	19870930	EP 1986-906113	19860918 <--
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	IL 80091	A1	19910630	IL 1986-80091	19860919 <--
	CN 86106266	A	19870408	CN 1986-106266	19860923 <--
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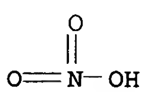
	FI 8702275	A	19870522	FI 1987-2275	19870522 <--
	NO 8702167	A	19870715	NO 1987-2167	19870522 <--
	US 4853357	A	19890801	US 1987-103442	19870930 <--
PRAI	US 1985-779501	A	19850924		
	WO 1986-US1950	A	19860918		

OS CASREACT 107:178602

AB Olefins are oxidized to carbonyl compds. in the presence of O and a catalyst system comprising a polyoxoanion and [XxMaM'bM''cOz]-m (M, M', M'' = W, Mo, V, Nb, Ta, Re; X = B, Si, Ge, P, As, Se, Te, I, Co, Mn, Cu; a, m, z = >0; b, c = integer; x = 0 for isopolyoxoanions, >0 for heteropolyoxoanions; such that a + b + c ≥2), ≥1 Pd component, ≥1 redox-active metal selected from CuSO4, Cu(OAc)2, Cu(NO3)2, Fe(OAc)2, FeSO4, and MnSO4, and a ligand. Thus, 73.2 g NaVO3 was dissolved in 380 mL H2O which had been heated to 90° forming a first solution, which was added to a 90° solution consisting of 120 mL H2O and 80.7 g Na2MoO4.2H2O. To this mixture, 50 mL of 85% H3PO4 was added dropwise, the solution heated to 95° for 1 h, filtered through Celite, .apprx.80 g K2SO4 was added to the filtrate which had been cooled to room temperature, the solution stirred for 1-1 1/2 h, and the K9PMo6V6O40 precipitate (I) was recrystd. from 0.25 M H2SO4. Li9PMo6V6O40 was prepared from I by ion-exchange chromatog., and served as the source for PMo6V6O40-9 (II). 1-Hexene was oxidized in the presence of 15 mL H2O, 1.5 mL 1 normal H2SO4, 625 mg II, and a 1:5:10 molar ratio of Pd(CS3CO2)2-II-CuSO4.2H2O. The oxidation was accomplished at 85°/80 psig O2 for 8 h producing 73.7 mol% 1-hexene conversion with 95.0 mol% selectivity to 2-hexanone, vs. 53.7 mol% and 90.8 mol% resp., for a control oxidation conducted without

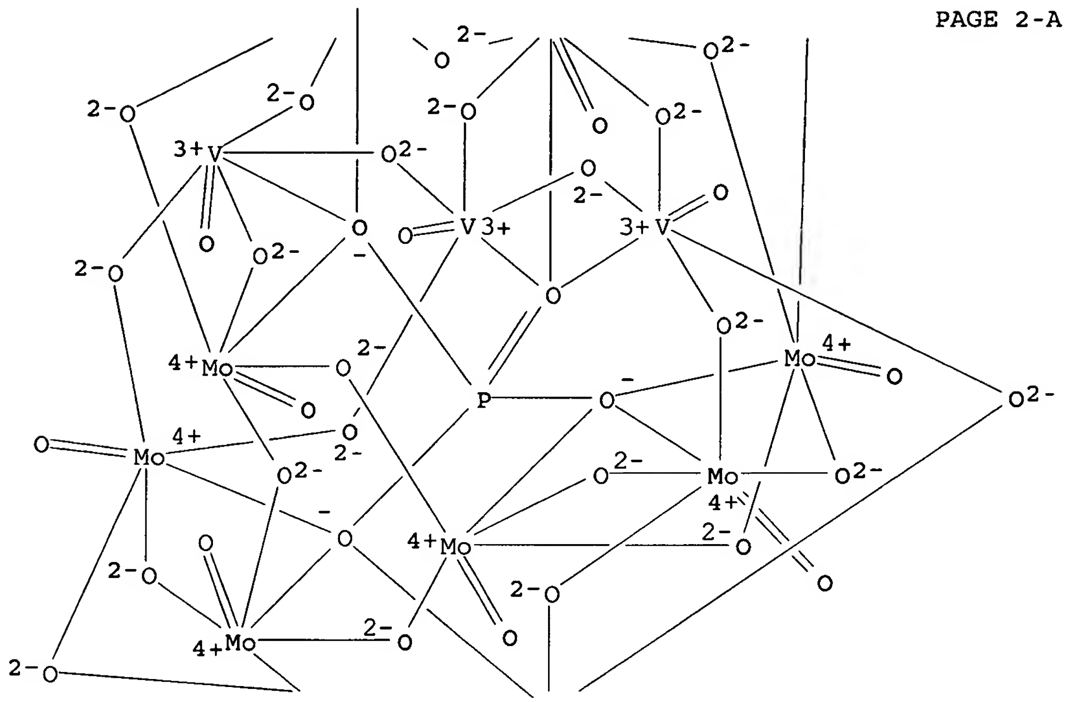
CuSO4.
IC ICM B01J023-76
ICS B01J023-84; C07C045-34; B01J023-82; B01J023-88
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
Section cross-reference(s): 23, 49, 67
IT 142-71-2, Cupric acetate 3094-87-9 **3251-23-8**, Cupric **nitrate** 7447-39-4, uses and miscellaneous 7487-88-9, uses and miscellaneous 7720-78-7 7758-98-7, uses and miscellaneous 10028-22-5, Ferric sulfate
RL: CAT (Catalyst use); USES (Uses)
(catalysts, containing palladium compds. and heteropolyoxyanions, for oxidation of olefins to carbonyl compds.)
IT 12411-60-8 12436-39-4 50811-90-0 55467-69-1 75656-58-5 76771-55-6 79154-02-2 97775-85-4 109904-92-9 **110350-74-8** **110350-76-0** 110350-77-1 110371-97-6 **110390-83-5** 110414-68-1 110739-87-2 110739-92-9 110743-20-9 110743-21-0 110743-22-1 110743-23-2 110743-25-4 110769-59-0 110873-93-3 **110873-94-4** **110900-30-6**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, containing redox-active metals and palladium compds., for oxidation of olefins)
IT 7757-79-1, Potassium **nitrate**, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with sodium tungstate and sodium metavanadate)
IT **3251-23-8**, Cupric **nitrate**
RL: CAT (Catalyst use); USES (Uses)
(catalysts, containing palladium compds. and heteropolyoxyanions, for oxidation of olefins to carbonyl compds.)
RN 3251-23-8 HCAPLUS
CN Nitric acid, copper(2+) salt (8CI, 9CI) (CA INDEX NAME)



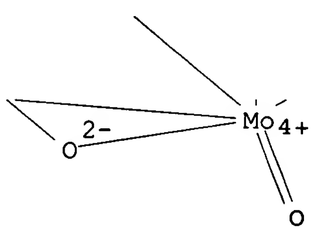
●1/2 Cu(II)

IT **110350-74-8** **110350-76-0** **110390-83-5** **110873-94-4** **110900-30-6**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, containing redox-active metals and palladium compds., for oxidation of olefins)
RN 110350-74-8 HCAPLUS
CN Vanadate(7-), (dodeca-μ-oxooctaoxooctamolybdate)dodeca-μ-oxotetraoxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-, heptasodium (9CI) (CA INDEX NAME)

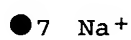
* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *



PAGE 2-A



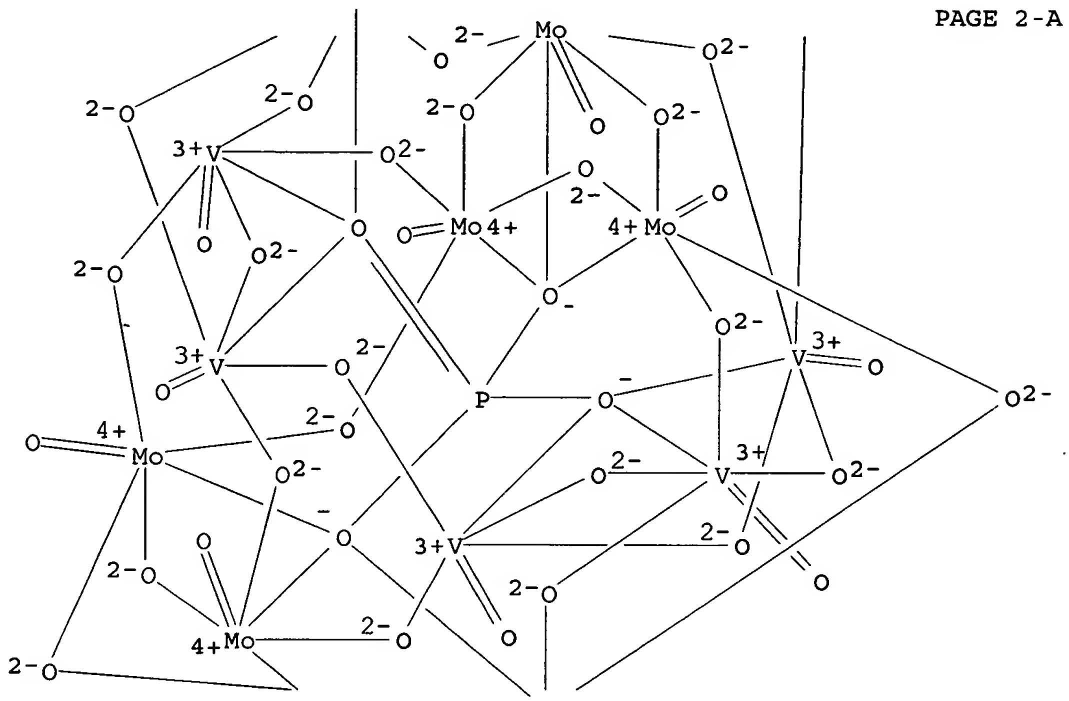
PAGE 3-A



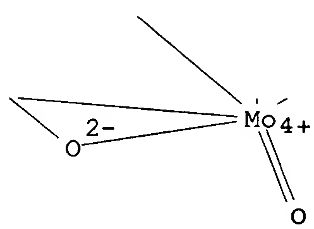
RN 110350-76-0 HCAPLUS
CN Vanadate(9-), (octa-μ-oxohexaoxohexamolybdate)hexadeca-μ-oxohexaoxo[μ12-[phosphato(3-)-O:O:O:O':O':O':O'':O'':O'':O''':O''':O''']]hexa-, nonalithium (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



PAGE 3-A



●9 Li^+

RN 110390-83-5 HCAPLUS
CN Vanadate(7-), [heptacosa-μ-oxopentadecaoxo[μ9-[phosphato(3-)-κO:κO:κO:κO':κO':κO'':κO'':.kapp
a.O''':κO''']]pentadecatungstate]octa-μ-oxooxo(μ-oxodioxodimolybdate)[μ9-[phosphato(3-)-κO:κO:κO:.kapp
a.O':κO':κO'':κO'':κO''':κO''']]-,
heptapotassium (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 110873-94-4 HCAPLUS
CN Vanadate(7-), (octadeca-μ-oxododecaoxododecatungstate)tetradeca-μ-oxooxobis[μ9-[phosphato(3-)-O:O:O:O':O':O'':O'':O''':O''']](tetra-μ-oxopentaoxopentamolybdate)-, heptapotassium (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 110900-30-6 HCAPLUS
CN Vanadate(12-), (octadeca-μ-oxododecaoxododecatungstate)octadeca-μ-oxohexaoxobis[μ9-[phosphato(3-)-O:O:O:O':O':O'':O'':O''':O''']]hexa-, dodecasodium (9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

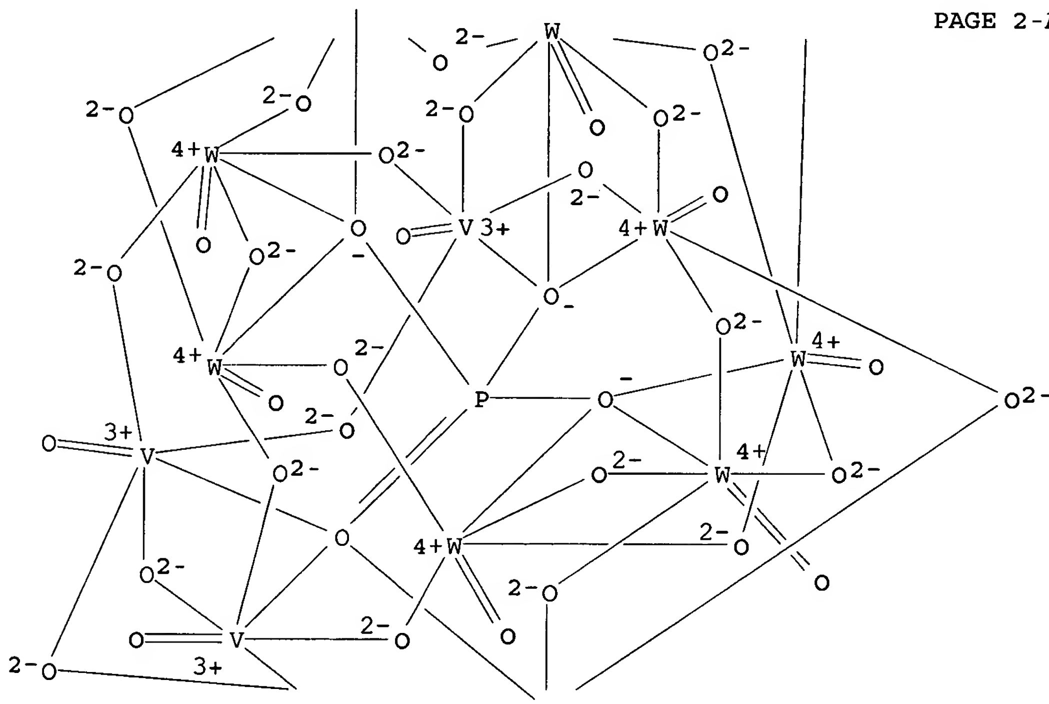
L35 ANSWER 26 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1987:73626 HCAPLUS
DN 106:73626
TI Oxidation of carbon monoxide to carbon dioxide by **heteropolyacids** in the presence of palladium
AU Zhizhina, E. G.; Kuznetsova, L. I.; Maksimovskaya, R. I.; Pavlova, S. N.; Matveev, K. I.
CS Inst. Catal., Novosibirsk, 630090, USSR
SO Journal of Molecular Catalysis (**1986**), 38(3), 345-53
CODEN: JMCADS; ISSN: 0304-5102
DT Journal
LA English
AB The low-temperature oxidation of CO to CO2 by solns. of PdSO4 and various **heteropolyacids** (HPAs) was studied. The dependence of the reaction rate on the potential of the HPA determined by its **composition** was obtained. Carbonyl complexes of reduced Pd show the highest catalytic activity. The activity of the SO2-supported homogeneous component was also examined The kinetic dependences indicate similar mechanisms for the reaction occurring in solution or on the surface of an inert support. During the oxidation of CO by O, only those HPAs are catalytically active whose reduced forms are oxidized by O.
CC 67-2 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
ST carbon monooxide oxidn palladium **heteropolyacid** catalyst; silica palladium **heteropolyacid** oxidn catalyst
IT **Heteropoly** acids
RL: CAT (Catalyst use); USES (Uses)
(catalysts from palladium and, in solution or support on silica, for oxidation of carbon monoxide)
IT Kinetics of oxidation
Oxidation
(of carbon monoxide, catalyzed by palladium and **heteropolyacids** in solution or support on silica)
IT Oxidation catalysts
(palladium and **heteropolyacids** in solution or supported on silica, for carbon monoxide)
IT Electric potential
(oxidation, of **heteropolyacids**, catalytic activity for oxidation of carbon monoxide in relation to)
IT **11074-20-7** 12026-57-2 **12293-15-1** **12293-21-9** **12293-24-2** **12398-73-1** **12398-74-2** 12411-60-8 **12786-62-8** **54327-43-4** 92627-49-1
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts from palladium and, in aqueous solution or supported on silica, for oxidation of carbon monoxide)
IT 7440-05-3, Palladium, uses and miscellaneous
RL: CAT (Catalyst use); USES (Uses)
(catalysts, **heteropolyacids** and, for oxidation of carbon monoxide)
IT 630-08-0, Carbon monoxide, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of, catalyzed by palladium and **heteropolyacids** in solution or supported on silica, kinetics and mechanism of)
IT **11074-20-7** **12293-15-1** **12293-21-9**

12293-24-2 12398-73-1 12398-74-2
12786-62-8 54327-43-4
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts from palladium and, in aqueous solution or supported on silica, for oxidation of carbon monoxide)

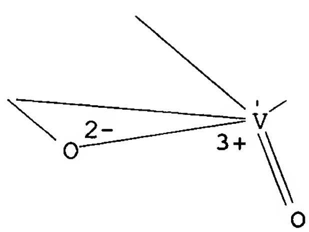
RN 11074-20-7 HCAPLUS
CN Vanadate(7-), (dodeca-μ-oxooctaoxooctatungstate)dodeca-μ-oxotetraoxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.ka ppa.O':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-, heptahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



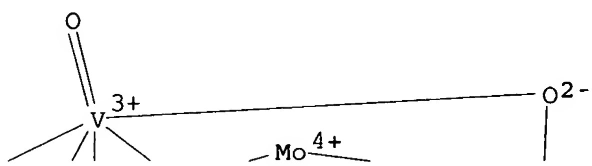
PAGE 3-A



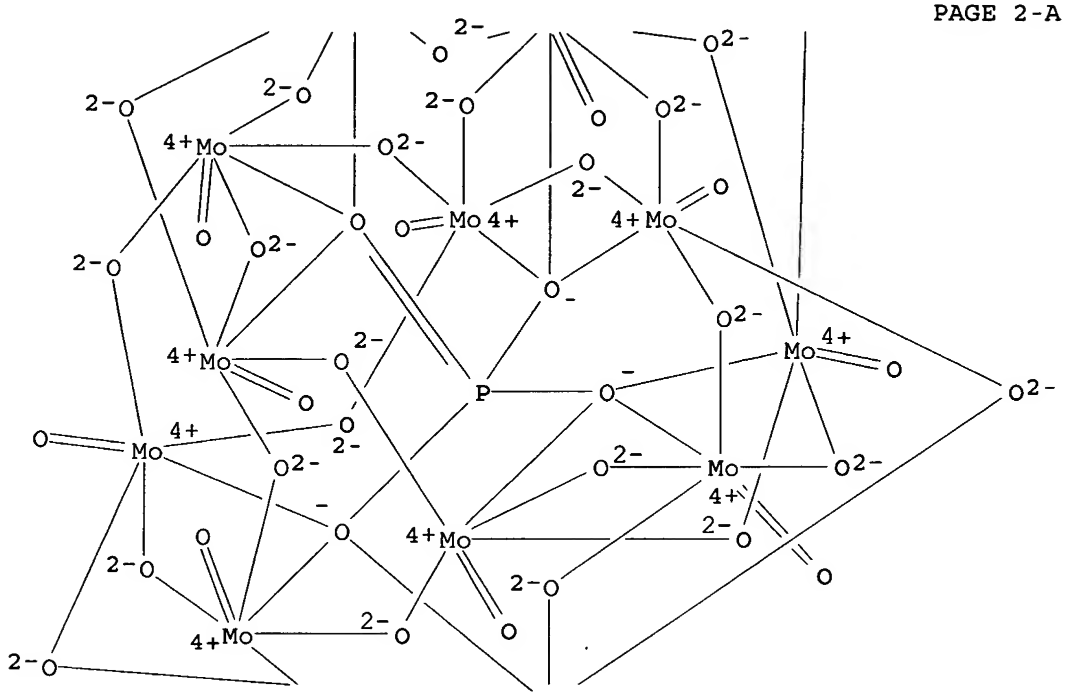
●7 H+

RN 12293-15-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecamolybdate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO
':κO':κO'':κO'':κO'':κO''':κO''':.kapp
a.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

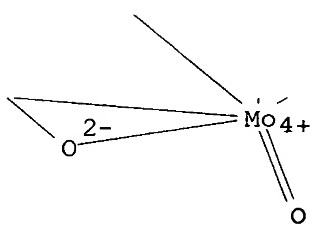
PAGE 1-A



PAGE 2-A



PAGE 3-A

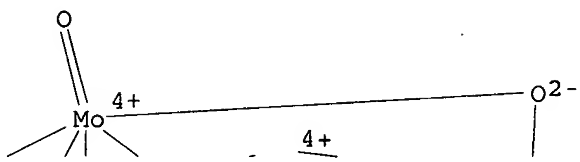


● 4 H^+

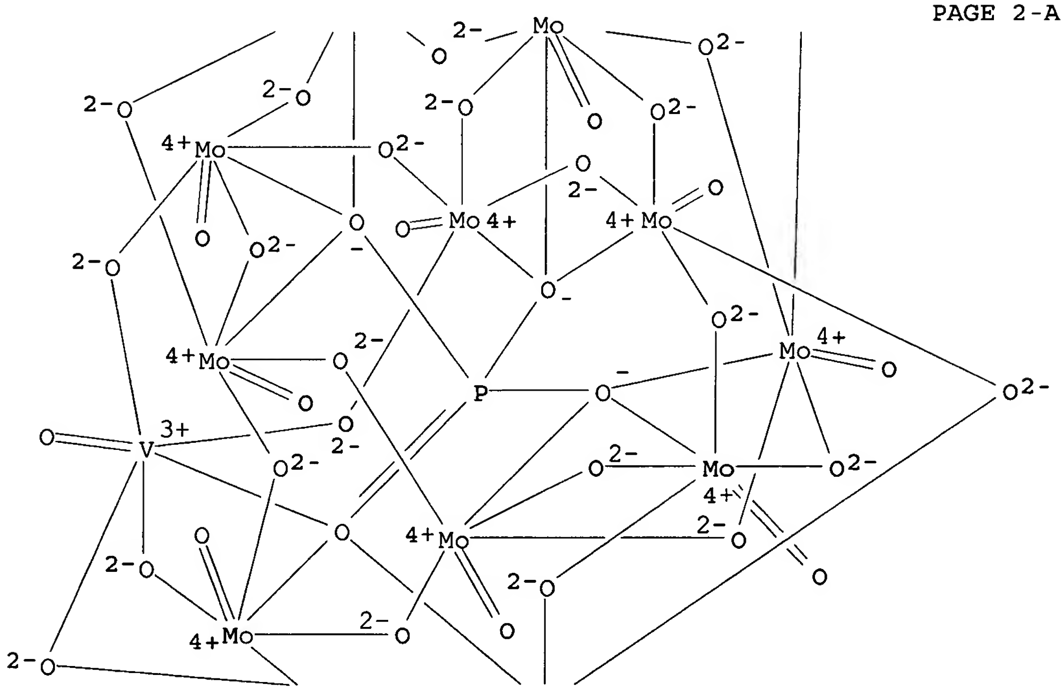
RN 12293-21-9 HCAPLUS

CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

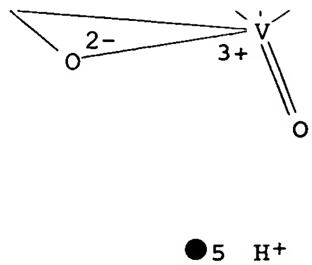
PAGE 1-A



PAGE 2-A

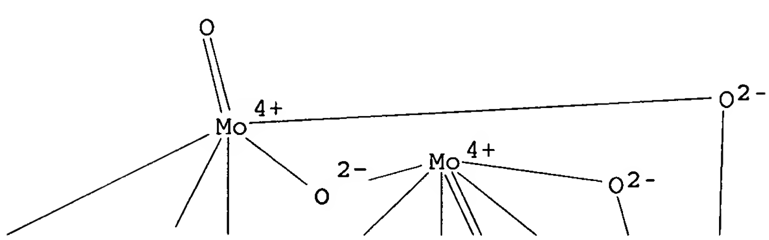


PAGE 3-A

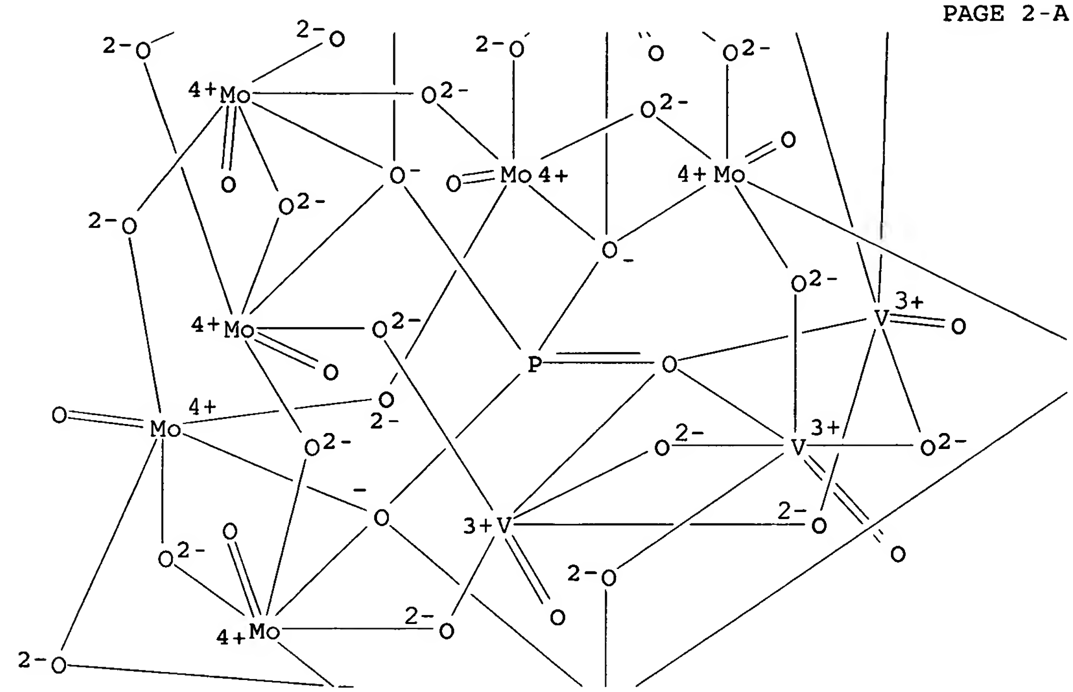


RN 12293-24-2 HCAPLUS
CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononamolybdate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

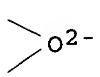
PAGE 1-A



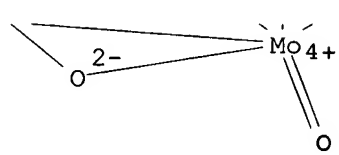
PAGE 2-A



PAGE 2-B



PAGE 3-A

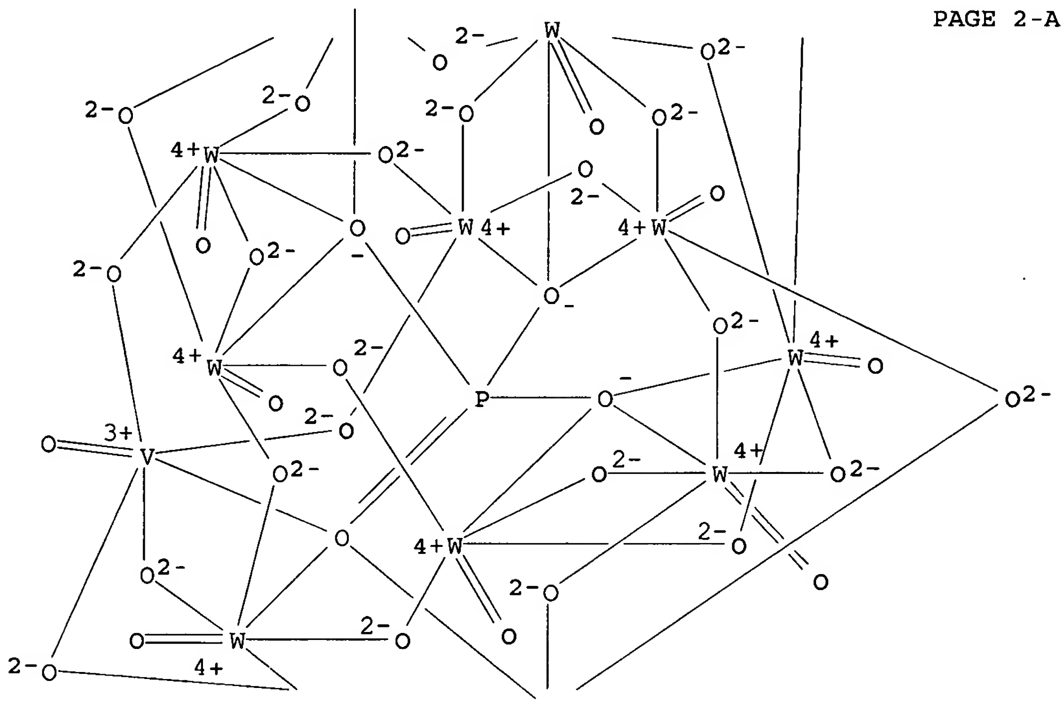


● 6 H^+

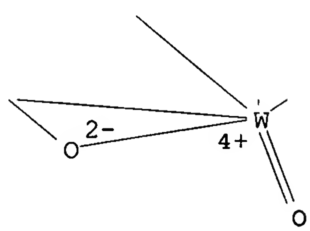
RN 12398-73-1 HCAPLUS
CN Vanadate(4-), (eicosa-μ-oxoundecaoxoundecatungstate)tetra-μ-oxooxo[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]-, tetrahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



PAGE 3-A

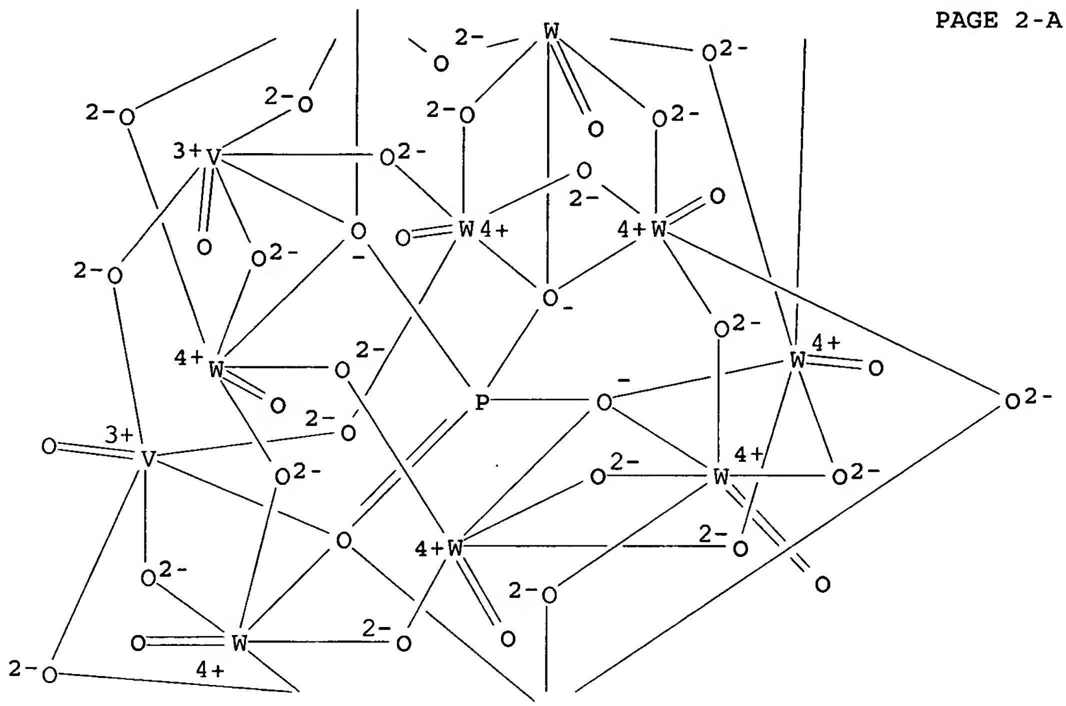


● 4 H+

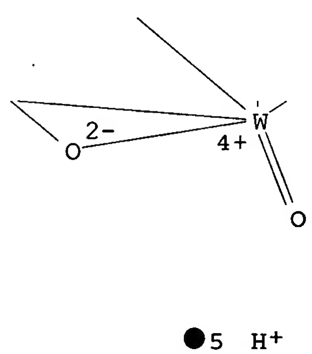
RN 12398-74-2 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecatungstate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A



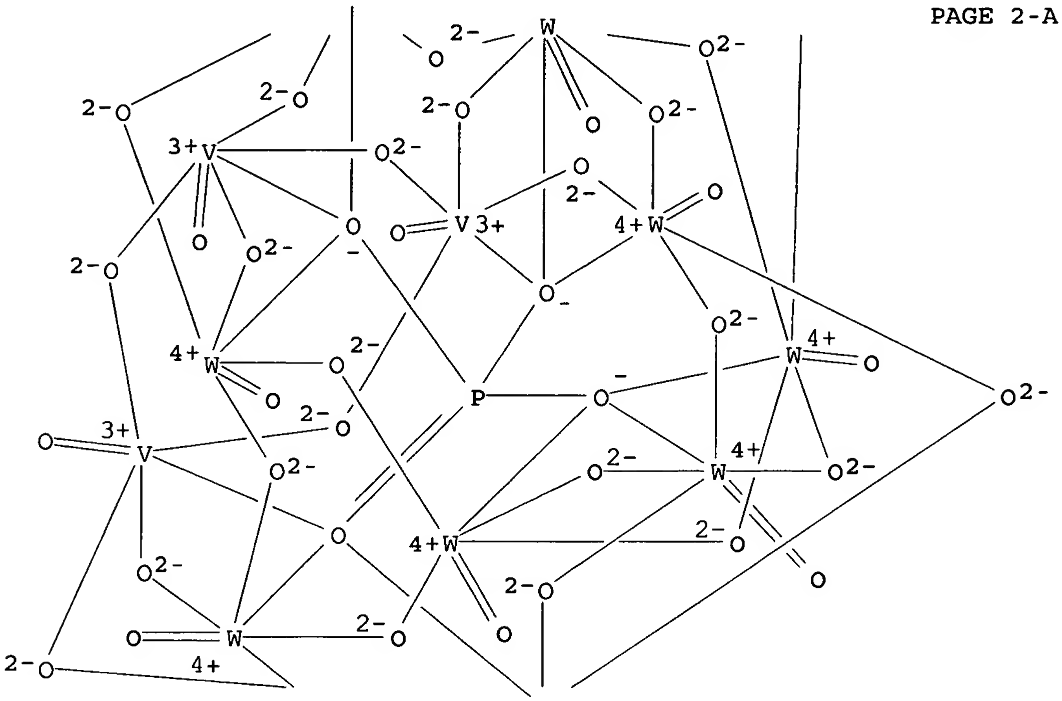
PAGE 3-A



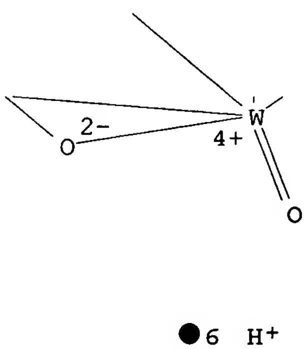
RN 12786-62-8 HCAPLUS
CN Vanadate(6-), nona-μ-oxotrioxo(pentadeca-μ-oxononaoxononatungstate)[μ12-[phosphato(3-)-κO:κO:κO:κO':κO':κO':κO'':.kappa.O'':κO'':κO''':κO''':κO''']]tri-, hexahydrogen (9CI) (CA INDEX NAME)

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

PAGE 2-A

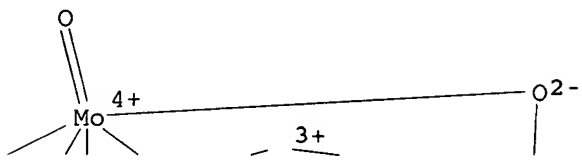


PAGE 3-A

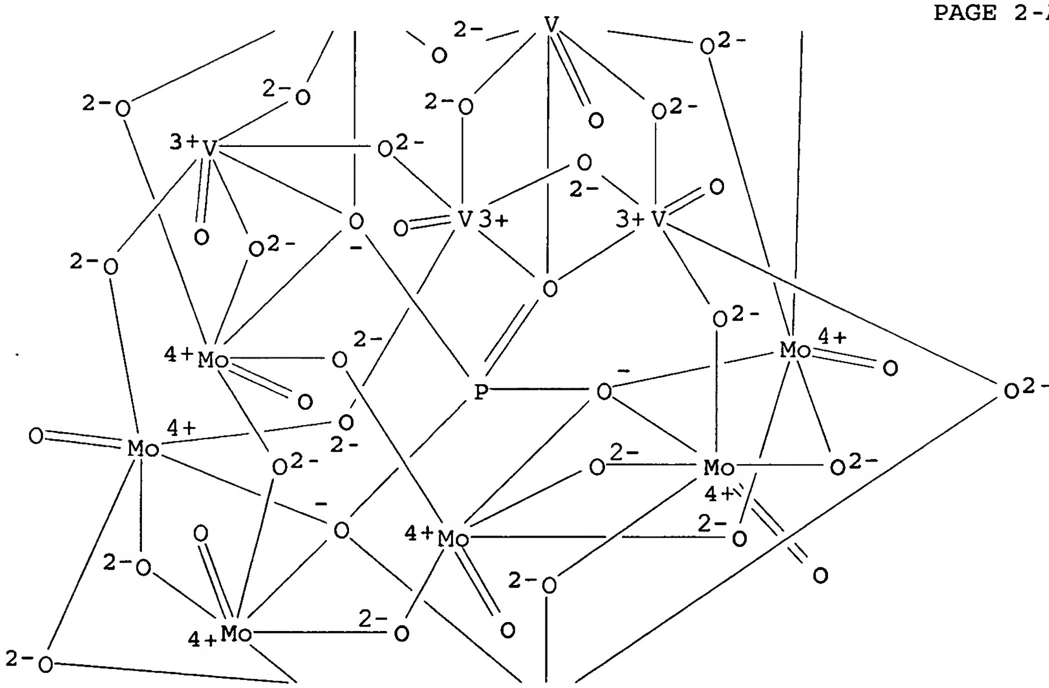


RN 54327-43-4 HCAPLUS
CN Vanadate(7-), (dodeca-μ-oxooctaoxooctamolybdate)dodeca-μ-oxotetraoxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':κO''']]tetra-, heptahydrogen (9CI) (CA INDEX NAME)

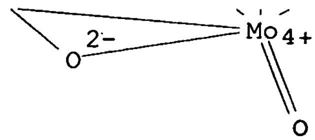
PAGE 1-A



PAGE 2-A



PAGE 3-A



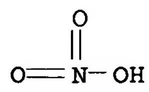
●7 H+

L35 ANSWER 27 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1983:216176 HCAPLUS
DN 98:216176
TI Heteropoly acids and their use
IN Schimizu, Shinkichi; Ichihashi, Hiroshi; Nagai, Koichi
PA Sumitomo Chemical Co., Ltd. , Japan
SO Eur. Pat. Appl., 18 pp.
CODEN: EPXXDW
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	EP 64371	A1	19821110	EP 1982-302109	19820423	<--
	EP 64371	B1	19841024			
	R: DE, FR, GB, IT, NL					
	JP 57179007	A2	19821104	JP 1981-62710	19810424	<--
	ES 511663	A1	19830701	ES 1982-511663	19820423	<--
	CA 1197066	A1	19851126	CA 1982-401601	19820423	<--
	US 4565801	A	19860121	US 1982-371223	19820423	<--
PRAI	JP 1981-62710	A	19810424			

AB 1,2-Molybdophosphoric acid and 12-molybdovanadophosphoric acid having cubic crystal structure, useful as catalysts for oxidizing methacrolein [78-85-3] to methacrylic acid [79-41-4], are prepared by calcining the corresponding ammonium salts at ≥400° in an inert atmospheric Thus, a solution of 17.5 g Na2HPO4.12H2O in 100 mL water was mixed with a solution containing 24.4 g NaVO3 in 100 mL water, mixed with 5 mL H2SO4, mixed with a solution of 121 g Na2MoO4.2H2O in 200 mL water, mixed with 85 mL H2SO4, cooled, mixed with 500 mL Et2O, separated to give 10-molybdo-2-vanadophosphoric acid (I). I was dissolved in 100 mL water, treated with 5.2 g NH4NO3 in 100 mL water, and centrifuged to give I ammonium salt. The ammonium salt was calcined 2 h at 480° in N to give I having cubic crystal structure. The calcined product was packed into a reactor and fed with a mixture containing methacrolein 3.7, O 7.4, N 74, and steam 14.9 mol% at space velocity 1800 h-1 and temperature 320° to give conversion of methacrolein 69.8%, yield of methacrylic acid 56.7%, and selectivity to methacrylic acid 81.2%.
IC C01G039-00; B01J023-28
CC 35-2 (Chemistry of Synthetic High Polymers)
Section cross-reference(s): 23
IT **3251-23-8** 7664-38-2, uses and miscellaneous 7803-55-6
12027-67-7 **12293-21-9**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for oxidation of methacrolein to methacrylic acid)
IT **3251-23-8 12293-21-9**
RL: **CAT (Catalyst use)**; USES (Uses)

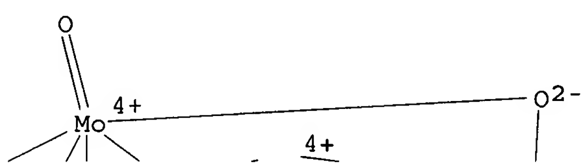
(catalysts, for oxidation of methacrolein to methacrylic acid)
RN 3251-23-8 HCAPLUS
CN Nitric acid, copper(2+) salt (8CI, 9CI) (CA INDEX NAME)



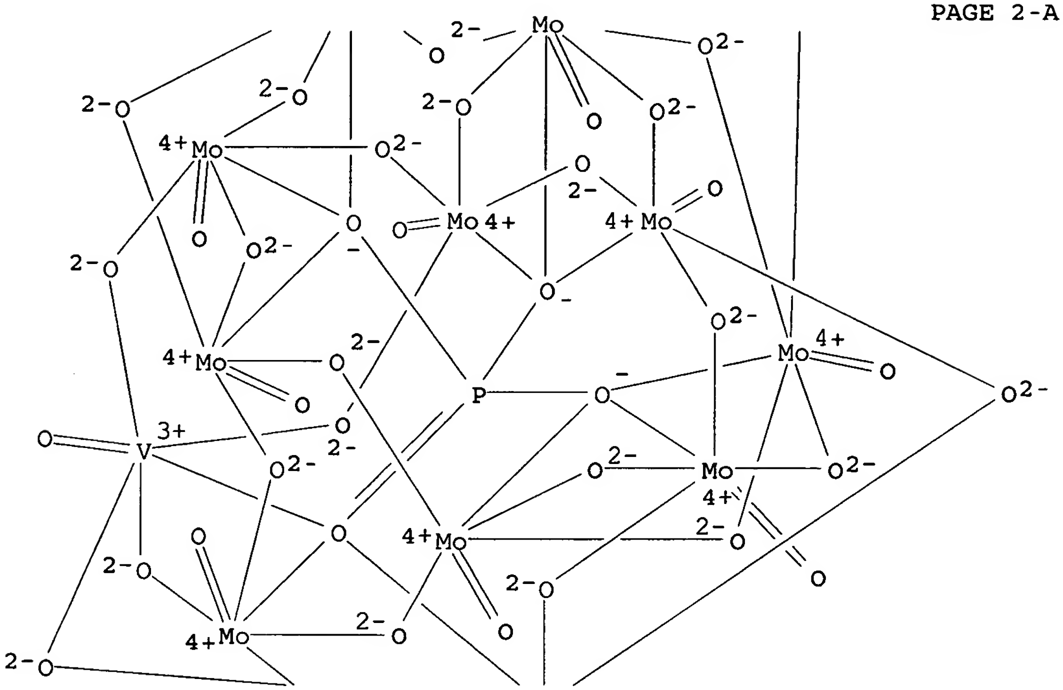
●1/2 Cu(II)

RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa.O':κO':κO'':κO'':κO'':κO''':κO''':.kappa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

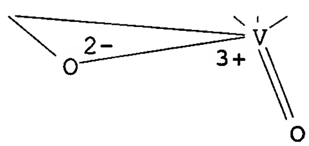
PAGE 1-A



PAGE 2-A



PAGE 3-A



● 5 H^+

L35 ANSWER 28 OF 29 HCAPLUS

AN 1977:468867 HCAPLUS
DN 87:68867
TI Methacrylic acid
IN Onoda, Takeru; Otake, Masayuki
PA Mitsubishi Chemical Industries Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 52039622	A2	19770328	JP 1975-116690	19750926 <--
PRAI	JP 1975-116690	A	19750926		

AB Isobutyric acid (I) [79-31-2] was dehydrogenated in the presence of

10-molybdo-2-vanadophosphoric acid (II) or a similar catalyst to prepare methacrylic acid (III) [79-41-4]. Thus, isobutyraldehyde was oxidized in a liquid phase at 40° to give a I solution and evaporated at 200° to give a gas containing 93% I, and a gaseous mixture of 1:2:1:4:45 (molar) I-water-O-N was contacted with 50% II on diatomaceous earth for 1.5 s at 302° to prepare III with selectivity 70.7% and I conversion 97.3%.

IC C07C057-04
CC 35-2 (Synthetic High Polymers)
IT **Nitrates**, compounds
RL: USES (Uses)
(reaction products with phosphoric acid, catalysts, for dehydrogenation of isobutyric acid)
IT 7447-40-7D, reaction product with antimony trichloride, iron **nitrate**, and phosphoric acid 7664-38-2D, reaction product with antimony trichloride, iron **nitrate**, and potassium chloride 10025-91-9D, reaction product with iron **nitrate**, phosphoric acid, and potassium chloride 10099-74-8D, reaction product with phosphoric acid 10402-29-6D, reaction product with phosphoric acid **12293-21-9** 14104-77-9D, reaction product with antimony trichloride, phosphoric acid, and potassium chloride 17309-53-4D, reaction product with phosphoric acid
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for dehydrogenation of isobutyric acid)
IT **12293-21-9**
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for dehydrogenation of isobutyric acid)
RN 12293-21-9 HCAPLUS
CN Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa .O':κO':κO'':κO'':κO'':κO''':κO''':.ka ppa.O''']]di-, pentahydrogen (9CI) (CA INDEX NAME)

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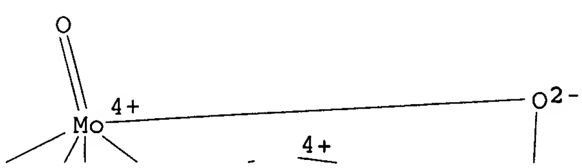

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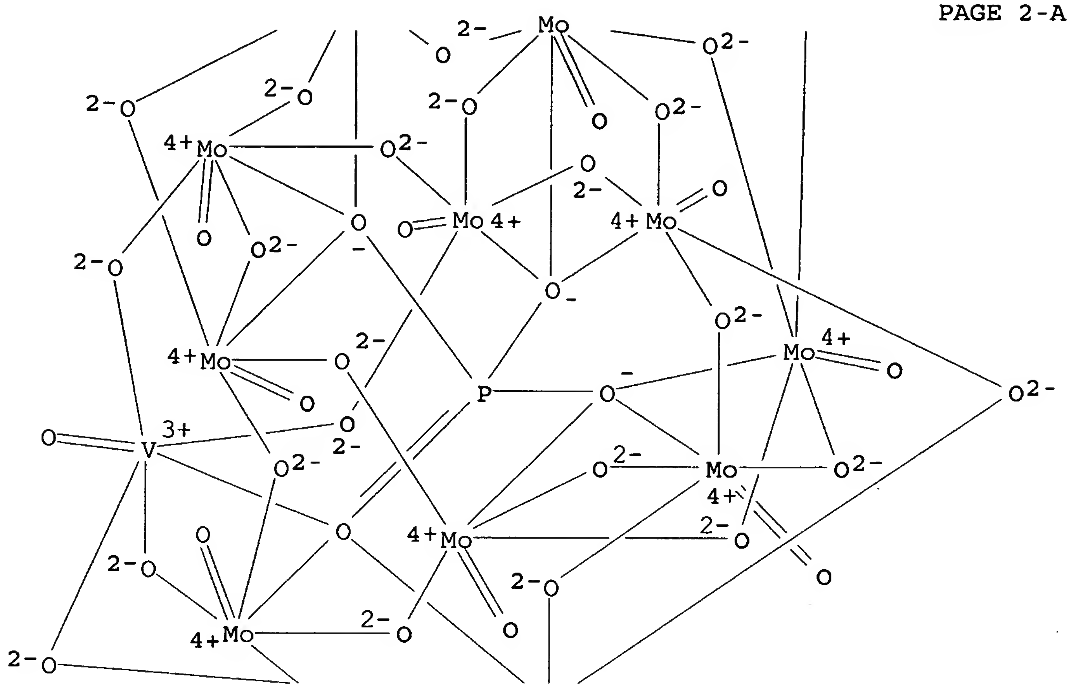

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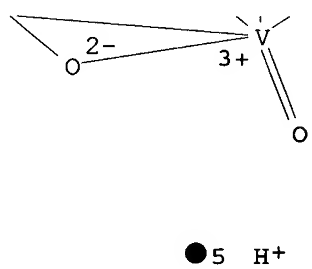

L35 ANSWER 29 OF 29 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 1977:453815 HCAPLUS
DN 87:53815
TI Methacrylic acid
IN Onoda, Takeru; Otake, Masayuki
PA Mitsubishi Chemical Industries Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 52031018	A2	19770309	JP 1975-105743	19750901 <--

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     JP 58026738          B4     19830604
PRAI JP 1975-105743       A      19750901
AB   Isobutyric acid (I) [79-31-2] is treated in the gas phase with O in the
     presence of a catalyst comprising Mo, P, and Cu; and possibly V and(or) W
     to give methacrylic acid (II) [79-41-4]. Thus, 100 g 24-40-mesh
     kieselguhr was impregnated with 2.42 g Cr(NO3)2.3H2O in 100 mL H2O,
     calcined 2 h at 400° in air, impregnated with 100 g
     H5Mo12V2PO40.nH2O in 100 mL H2O, and dried to give a catalyst. A
     1:2:1.5:30 (molar) gaseous mixture of I-steam-O-N was passed through
     (contact time 0.8 s) a Pyrex reactor filled with the catalyst at
     285° to give a product (I conversion 94.5%) containing 75.8% II.
IC   C07C057-04
CC   35-2 (Synthetic High Polymers)
     Section cross-reference(s): 23
IT   12293-21-9
     RL: CAT (Catalyst use); USES (Uses)
        (catalysts, containing copper, for oxidative dehydrogenation of isobutyric
        acid)
IT   3251-23-8   7447-39-4, uses and miscellaneous   7758-98-7, uses
     and miscellaneous   7789-45-9
     RL: USES (Uses)
        (heteropoly acid catalysts containing, for oxidative dehydrogenation of
        isobutyric acid)
IT   12293-21-9
     RL: CAT (Catalyst use); USES (Uses)
        (catalysts, containing copper, for oxidative dehydrogenation of isobutyric
        acid)
RN   12293-21-9  HCAPLUS
CN   Vanadate(5-), (heptadeca-μ-oxodecaoxodecamolybdate)hepta-μ-
     oxodioxo[μ12-[phosphato(3-)-κO:κO:κO:κO':.kappa
     .O':κO':κO'':κO'':κO'':κO''':κO''':.ka
     ppa.O''']]di-, pentahydrogen (9CI)  (CA INDEX NAME)
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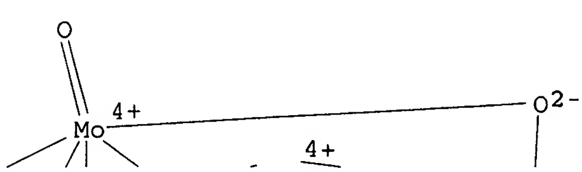
PAGE 1-A



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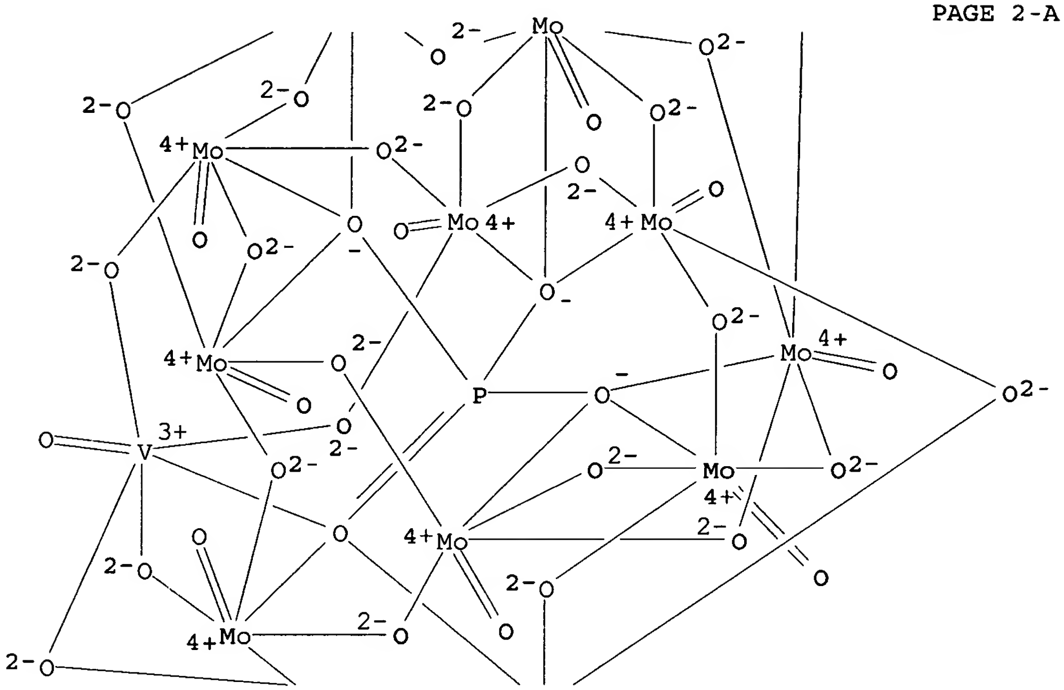

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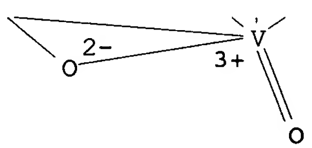
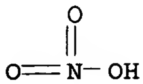


● 5 H+

IT 3251-23-8
RL: USES (Uses)
(heteropoly acid catalysts containing, for oxidative dehydrogenation of isobutyric acid)

RN 3251-23-8 HCAPLUS

CN Nitric acid, copper(2+) salt (8CI, 9CI) (CA INDEX NAME)



●1/2 Cu(II)

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